

AD-A160 530

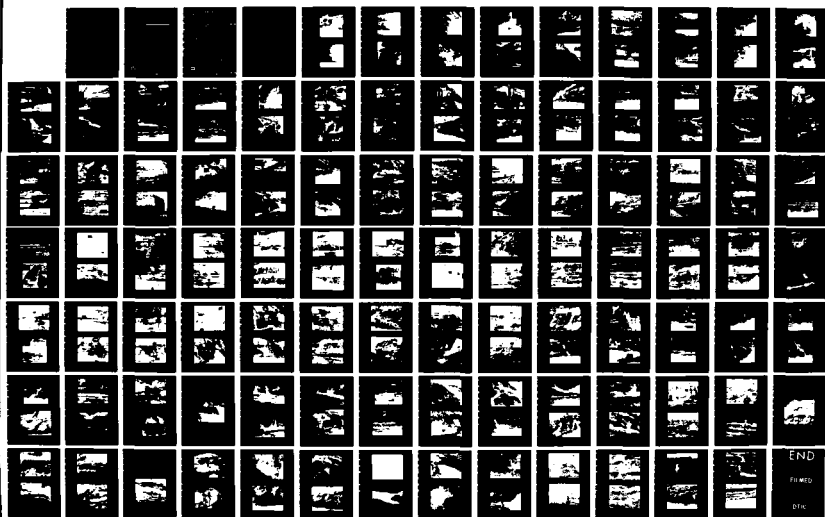
CLARENCE CANNON DAM AND MARK TWAIN LAKE FOUNDATION AND  
EMBANKMENT COMPLET (U) ARMY ENGINEER DISTRICT ST LOUIS  
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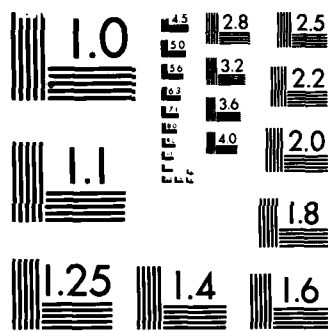
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NATIONAL BUREAU OF STANDARDS-1963-A

# CLARENCE CANNON DAM & MARK TWAIN LAKE

6

AD-A160 530

## FOUNDATION AND EMBANKMENT COMPLETION REPORT

### PART II MAIN DAM

### PHASE II CONSTRUCTION AND RELATED CONTRACTS

### VOLUME III — PHOTOGRAPHS PAGES 292 THRU 383

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DECEMBER 1984

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# CLARENCE CANNON DAM & MARK TWAIN LAKE

6

AD-A160 530

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# SECTION 4

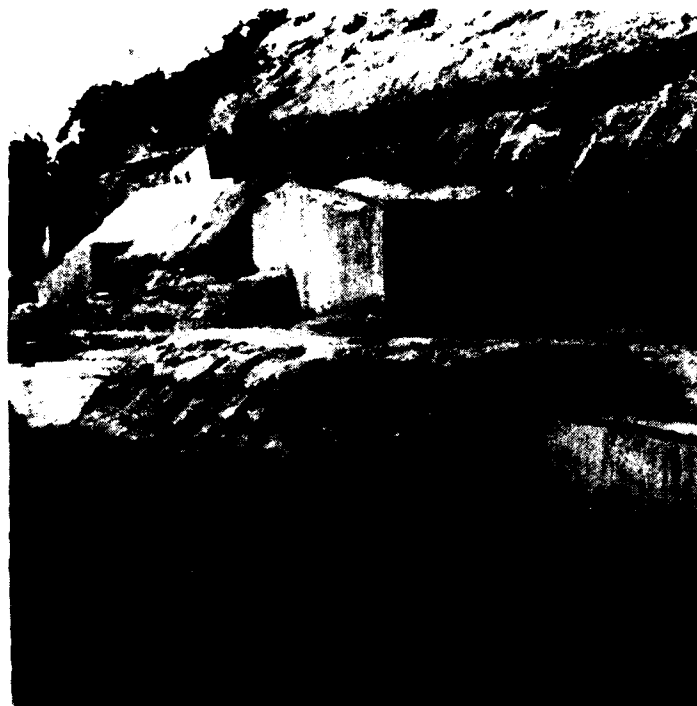
## LEFT ABUTMENT :

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A. BASAL CONCRETE FILLETS	180 - 196
B. CUTOFF WALL	197 - 284
C. DOWNSTREAM RAVINE	285 - 291
D. EMBANKMENT CONTACT AREA	292 - 376
E. CUTOFF TRENCH	377 - 383

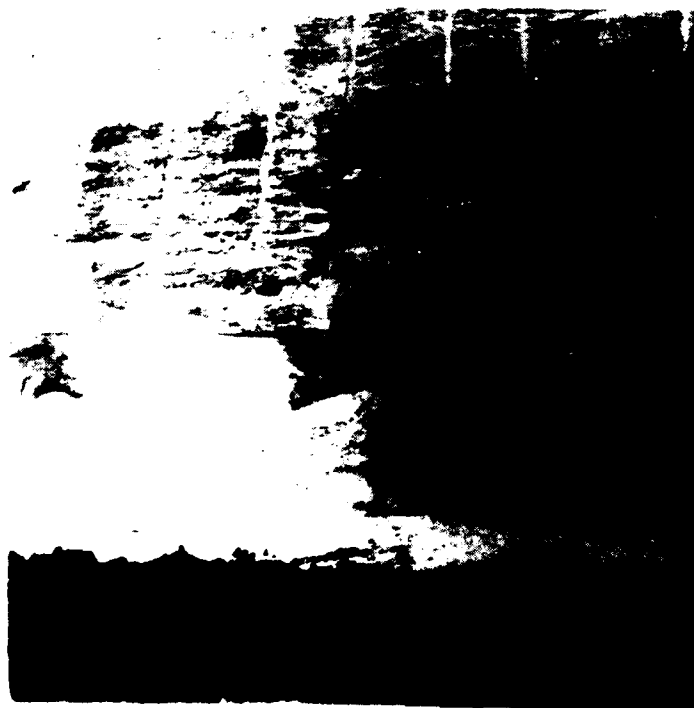
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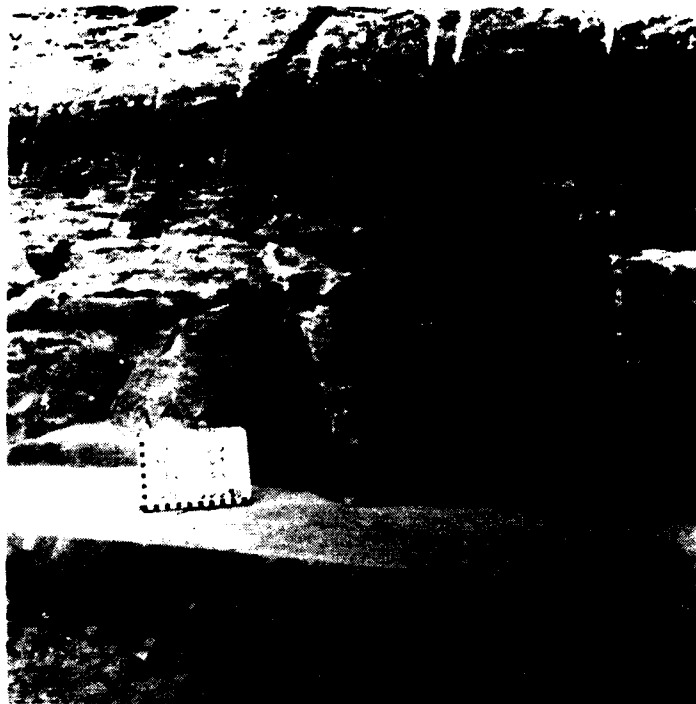
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Concrete fillets and wedges at approximate Station 18+00, Offset 255 feet upstream, Elevation 555 feet. Final foundation left abutment.



Station 18+09, Offset 103 feet upstream. Elevation 556 feet. Final foundation left abutment. 23 September 1980



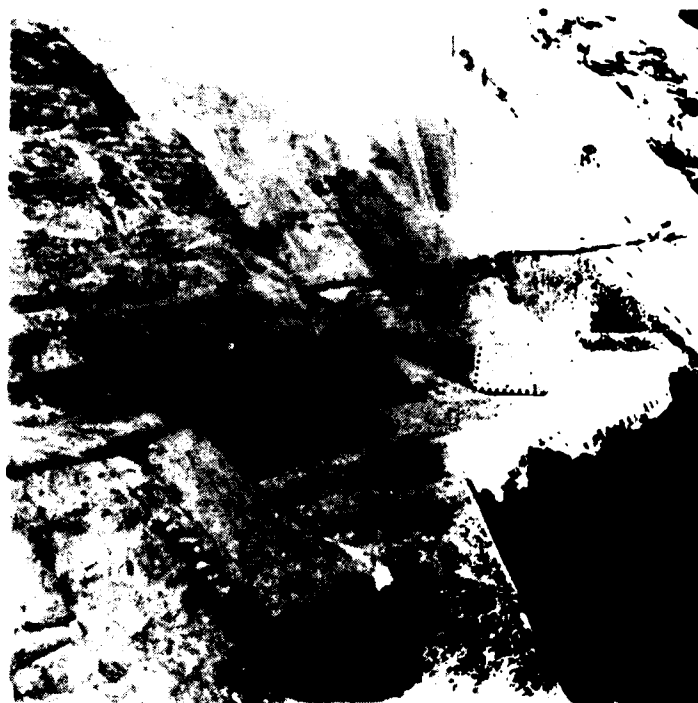
Station 18+09, Offset 85 feet upstream, Elevation 556 feet. Final foundation left abutment. 22 September 1980



Station 18+05, Offset 65 feet upstream, Elevation 556 feet. Final foundation left abutment. 22 September 1980



Station 18+05, Offset 40 feet upstream, Elevation 556 feet. View downstream. Final foundation left abutment. 22 Sept. 1980.

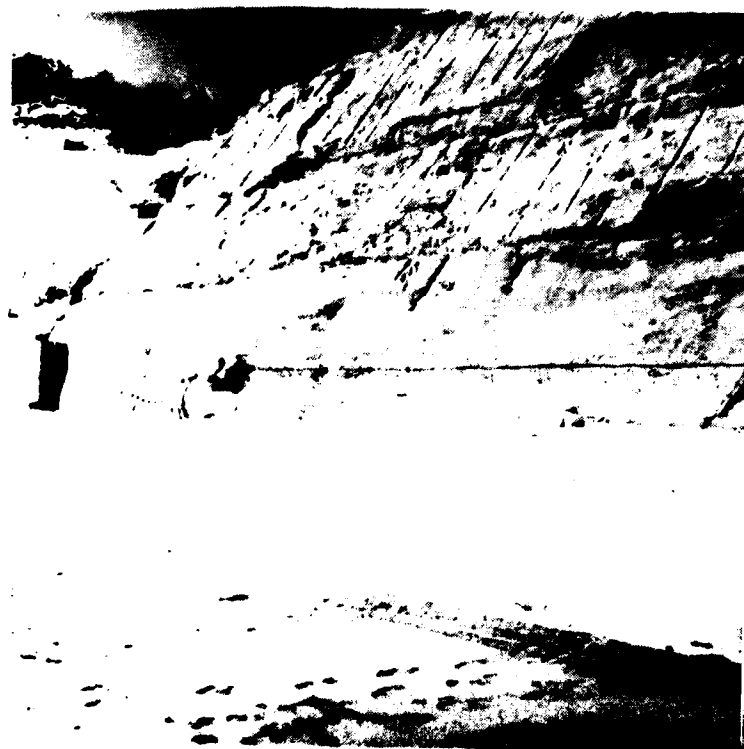


Station 18+15, Offset 18 feet upstream, Elevation 556 feet. View downstream. Final foundation left abutment. 19 Sept. 1980.





Station 18+10, Offset 100 feet downstream, Elevation 556 feet. Final foundation left abutment. 29 Sept. 1980.



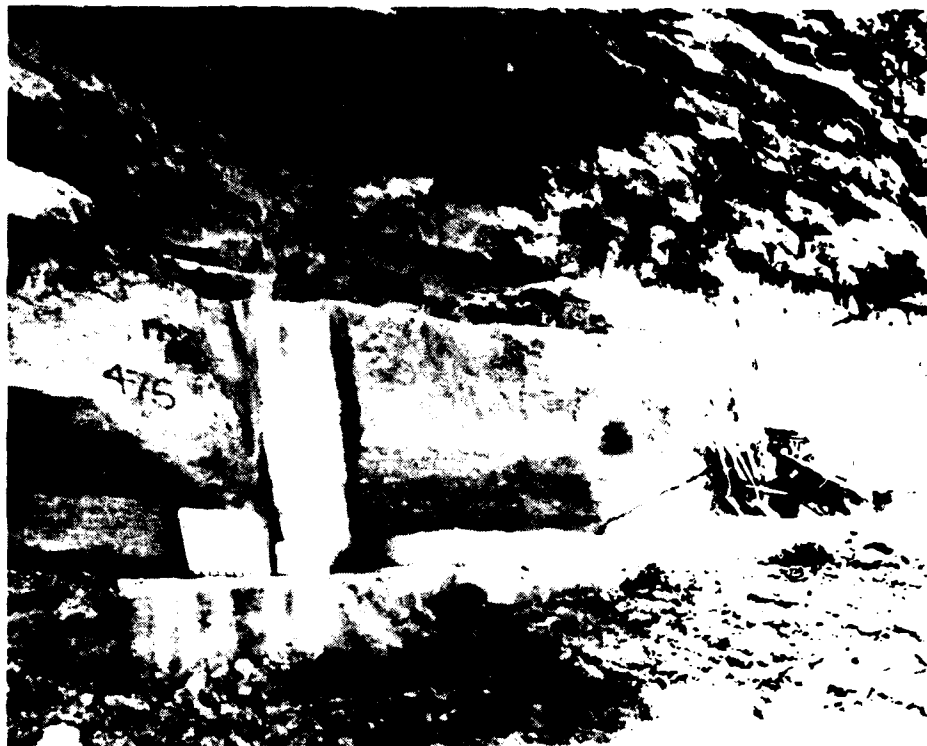
Station 17+85, Offset 200 feet downstream, Elevation 556 feet. Final foundation left abutment. 6 Oct. 1980.



Station 17+85, Offset 225 feet downstream, Elevation 556 feet. Final foundation left abutment. 6 Oct. 1980.



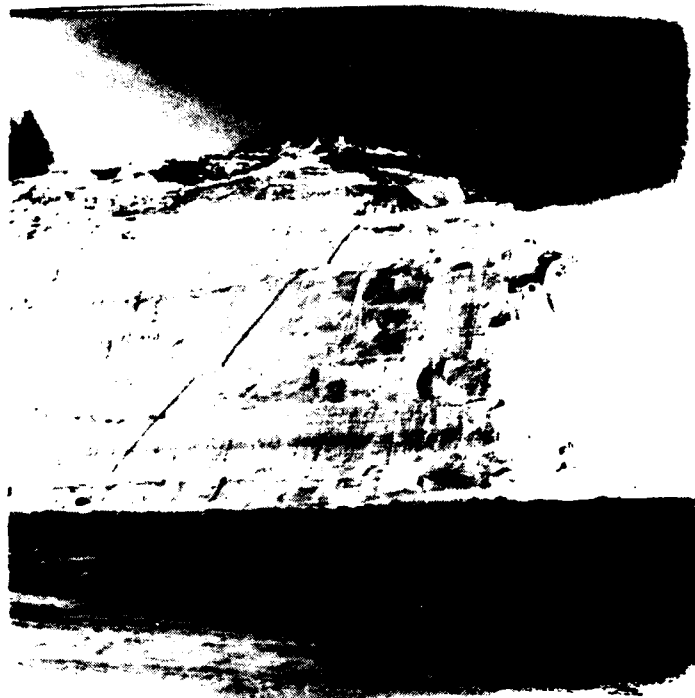
Station 17+85, Offset 275 feet downstream, Elevation 556 feet. View downstream. Final foundation left abutment. 6 Oct. 1980.



Station 17+94, Offset 475 feet upstream, Elevation 562 feet. Final foundation left abutment. 12 June 1981.



Station 17+97, Offset 220 feet upstream, Elevation 650 feet. Final foundation left abutment. 6 Oct. 1980.



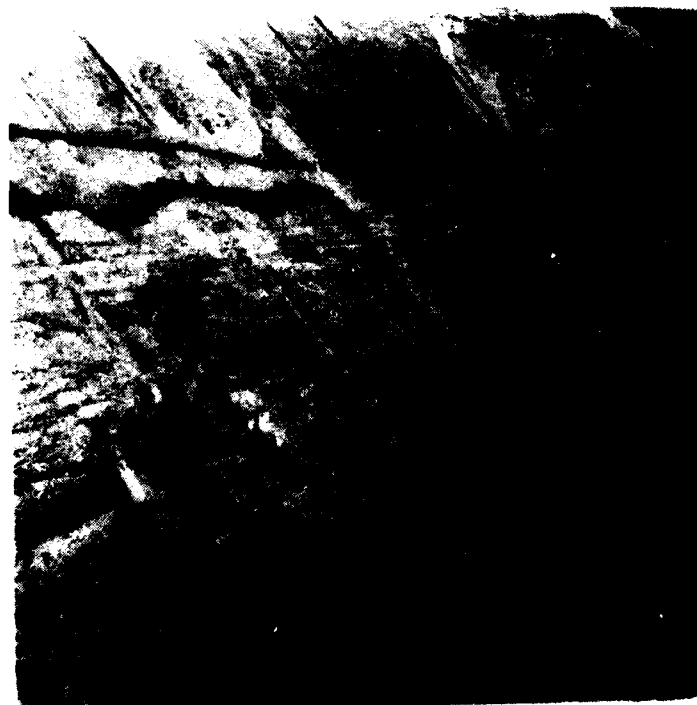
General view of left abutment from centerline to 140 feet upstream. Diagonal line represents upstream limits of pseudocore. Horizontal line represents elevation 559 feet, which is approved limit. Sept. 1980.



Placing concrete wedge downstream of cutoff wall. Station 18+20, Offset 30 feet downstream, Elevation 562 feet. 19 Sept. 1980.



Station 18+16, Offset 35 feet downstream, Elevation 559 feet. View upstream. Final foundation left abutment. 29 Sept. 1980.



Station 18+16, Offset 35 feet downstream, Elevation 559 feet. View downstream. Final foundation left abutment. 29 Sept. 1980.



Station 18+20, Offset 85 feet downstream, Elevation 562 feet. View downstream. Final foundation left abutment. 29 Sept. 1980.



Station 18+20, Offset 100 feet downstream, Elevation 562 feet. Final foundation left abutment. 29 Sept. 1980.



Station 17+85, Offset 425 feet upstream, Elevation 564 feet. Final foundation left abutment. 12 June 1981.



Station 17+81, Offset 400 feet upstream, Elevation 564 feet. View downstream. Final foundation left abutment. 12 June 1981.



Station 17+92, Offset 350 feet upstream, Elevation 564 feet. Final foundation left abutment. 12 June 1981.



Station 17+94, Offset 300 feet upstream, Elevation 564 feet. View downstream. Final foundation left abutment. 10 June 1981.





Station 17+94, Offset 300 feet upstream, Elevation 564 feet. Final foundation left abutment. 10 June 1981.



Station 18+05, Offset 275 feet upstream. Elevation 565 feet. Final foundation left abutment. 10 June 1981.



Station 18+15, Offset 225 feet upstream, Elevation 564 feet. Final foundation left abutment. 10 June 1981.



Station 18+25, Offset 150 feet upstream, Elevation 565 feet. Final foundation left abutment. 10 June 1981.



Placing concrete at downstream edge of cutoff wall, at approximate station 18+20, Offset 20 feet downstream, Elevation 565. 19 Sept. 1980.



Station 17+80, Offset 392 feet downstream. Elevation 563 feet. Final foundation left abutment. 6 Oct. 1980.



Station 17+68, Offset 425 feet downstream, Elevation 565 feet. Final foundation left abutment. 10 June 1981.



Station 18+18, Offset 50 downstream, Elevation 568 feet. Final foundation left abutment. 10 Oct. 1980.



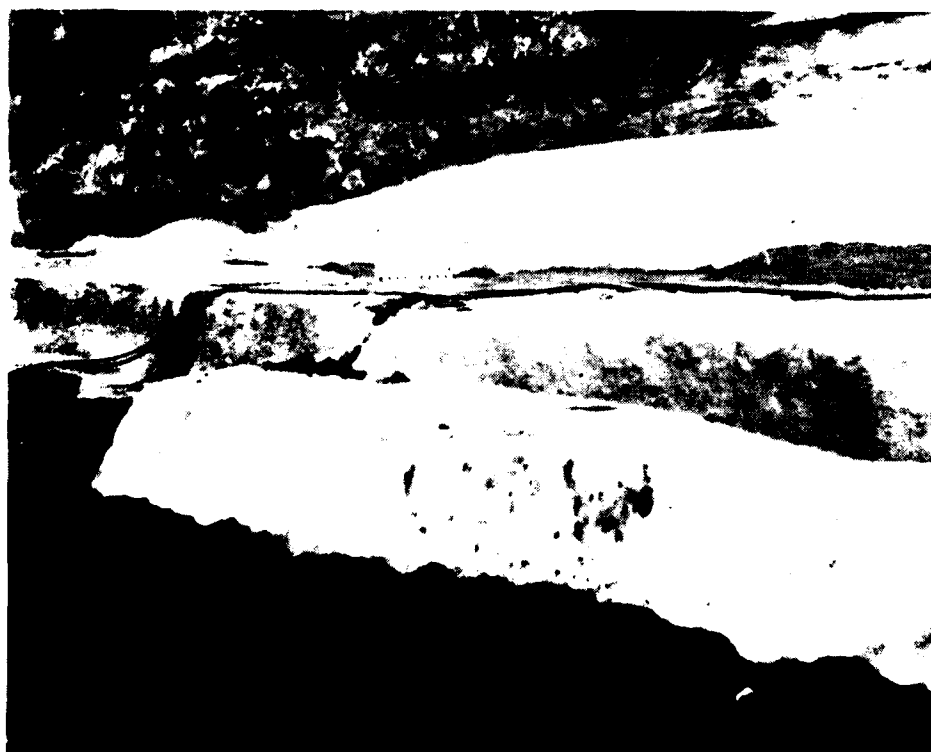
Station 18+18. Offset 75 feet downstream, Elevation 568 feet. Final foundation left abutment. Diagonal line is downstream limits of pseudocore. 9 June 1981.



Station 18+18. Offset 100 feet downstream, Elevation 568 feet. Final foundation left abutment. Diagonal line is downstream limits of pseudocore. 9 June 1981.



Station 18+15, Offset 100 feet downstream, Elevation 567 feet. View downstream. Final foundation left abutment. 10 Oct. 1980.



Station 17+95, Offset 425 feet upstream, Elevation 570 feet. Final foundation left abutment. 15 Sept. 1981.



Station 17+90, Offset 400 feet upstream, Elevation 570 feet. Looking downstream at final foundation of left abutment. 15 Sept. 1981.



Station 18+00, Offset 300 feet upstream, Elevation 572 feet. Final foundation left abutment. 15 Sept. 1981.



General shot of Chouteau Limestone looking upstream before dental treatment has been performed. Elevation 570 feet.



Station 18+10, Offset 270 feet upstream, Elevation 572 feet. Final foundation left abutment. Diagonal line is upstream limits of embankment protection zone. 20 Aug. 1981.

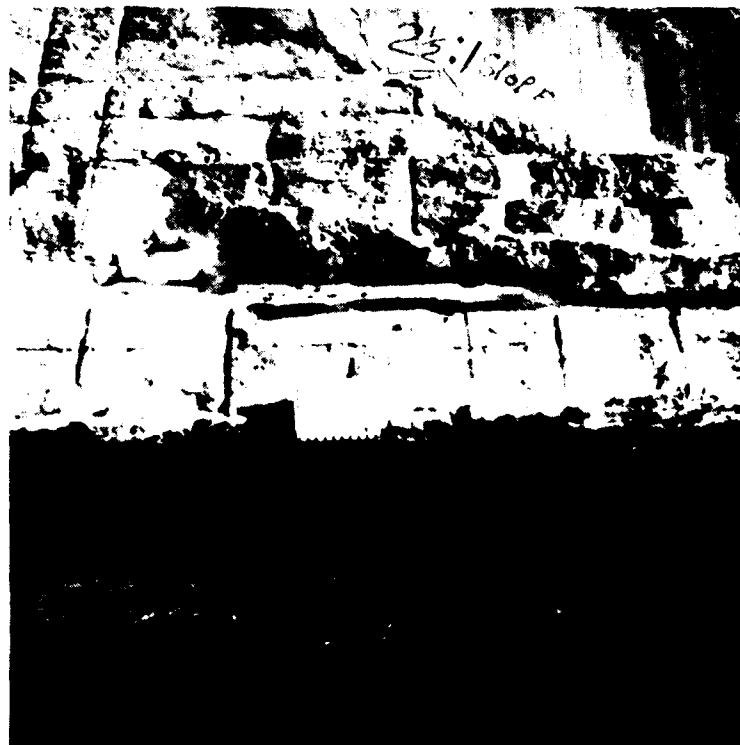




Station 18+20, Offset 250 feet upstream, Elevation 572 feet. Final foundation left abutment. Diagonal line represents upstream limits of embankment protection zone. 20 Aug. 1981.



Station 18+22, Offset 225 feet upstream, Elevation 573 feet. Final foundation left abutment. Diagonal line represents upstream limits of embankment protection zone. 20 Aug. 1981.



Station 18+25, Offset 185 feet upstream, Elevation 573 feet. Final foundation left abutment. Diagonal line represents downstream limits of embankment protection zone. 20 Aug. 1981.



Station 18+25, Offset 150 feet upstream, Elevation 568 feet. Final foundation left abutment. 10 June 1981.



Station 18+28, Offset 145 feet upstream, Elevation 570 feet. Final foundation left abutment. 10 Oct. 1980.



Station 18+30, Offset 125 feet upstream, Elevation 568 feet. View downstream. Final foundation left abutment. 10 Oct. 1980.



Station 18+28, Offset 25 feet upstream, Elevation 569 feet. Final foundation in pseudocore on left abutment. 10 Oct. 1980.



Station 18+20, Offset 50 feet downstream, Elevation 570 feet. Final foundation in pseudocore on left abutment. 9 June 1981.



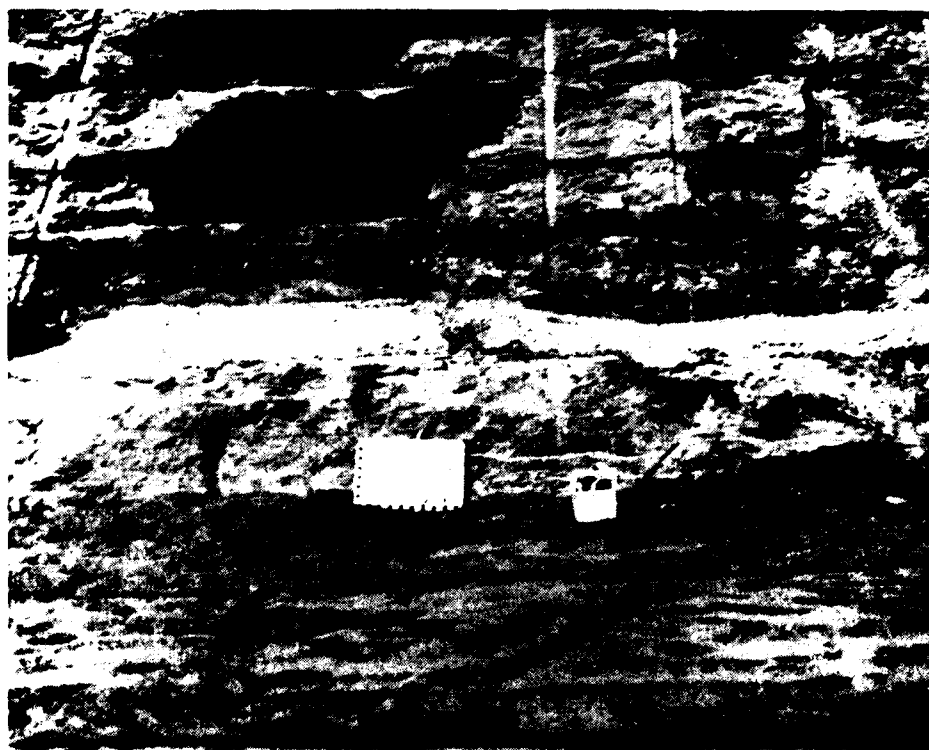
Station 18+20, Offset 60 feet downstream, Elevation 571 feet. Final foundation in pseudocore on left abutment. 9 July 1982.



Station 18+20, Offset 95 feet downstream, Elevation 571 feet. Final foundation in pseudocore on left abutment. Diagonal line represents downstream limits of pseudocore. 9 July 1982.



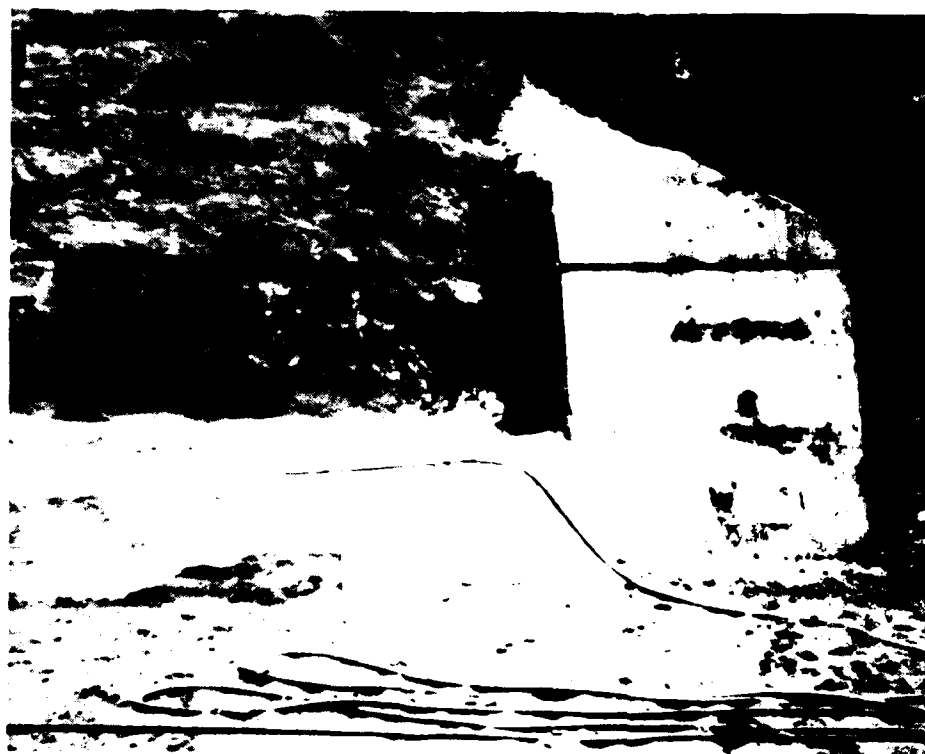
Station 18+12, Offset 125 feet downstream, Elevation 569 feet. Final foundation left abutment. Concrete was placed over large open bedding plane to prevent contamination of sand drain. 9 June 1981.



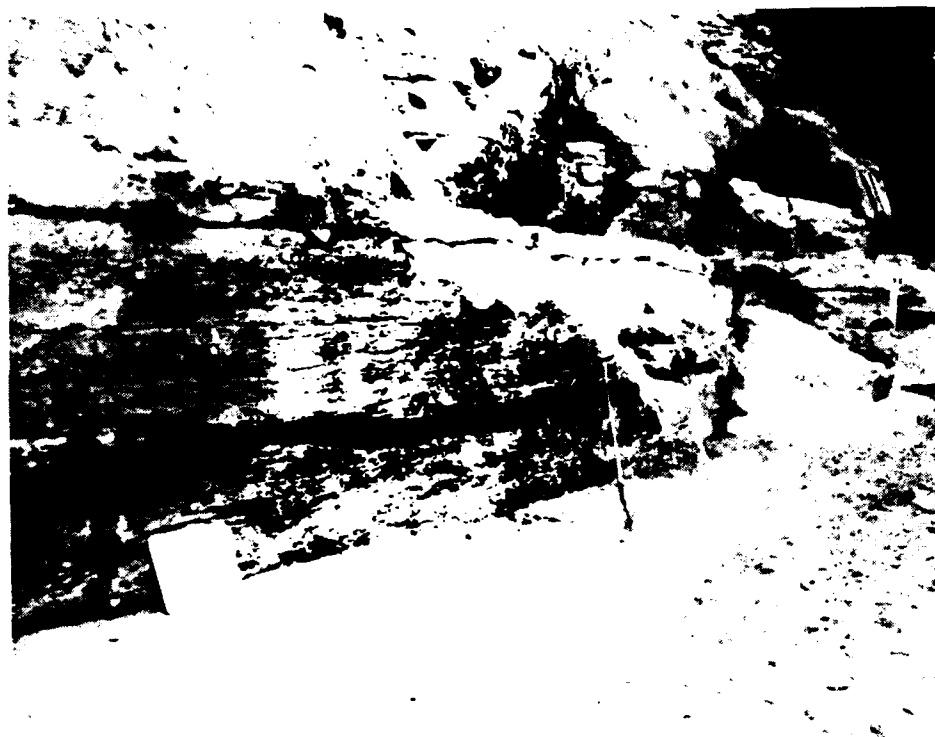
Station 18+11, Offset 150 feet downstream, Elevation 569 feet. Final foundation on left abutment within sand drain limits. 9 June 1981.



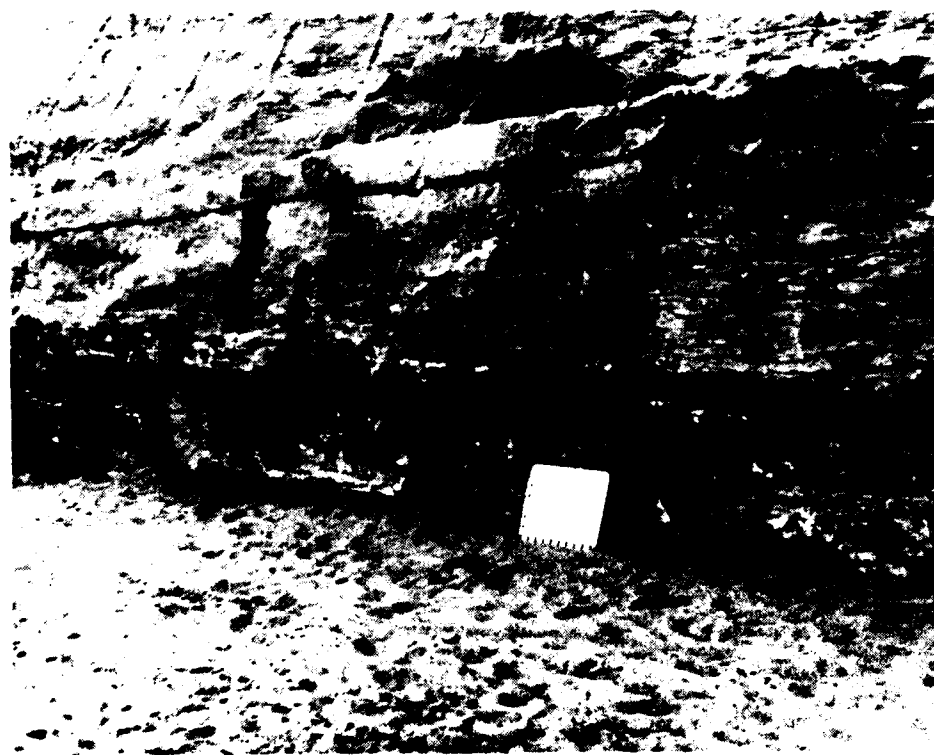
Station 18+10, Offset 175 feet downstream, Elevation 569 feet. View downstream of final foundation on left abutment. 9 June 1981.



Station 18+05, Offset 225 feet downstream, Elevation 569 feet. Final foundation left abutment sand drain. 9 June 1981.



Station 18+00, Offset 275 feet downstream, Elevation 569 feet. Looking downstream at final foundation of left abutment sand drain. 9 June 1981.



Station 18+00, Offset 275 feet downstream, Elevation 569 feet. Looking upstream at final foundation of left abutment sand drain. 9 June 1981.

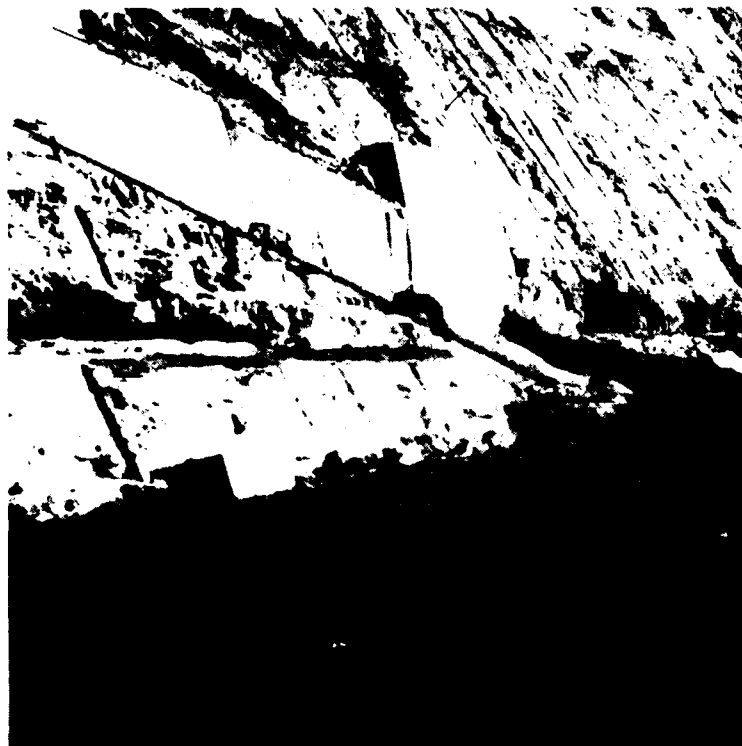




Station 17+86, Offset 325 feet downstream, Elevation 569 feet. Final foundation left abutment. Vertical line represents downstream limits of sand placement for sand drain. 9 June 1981.



Station 17+73, Offset 425 feet downstream, Elevation 569 feet. Final foundation left abutment. Diagonal line represents final template. 6 June 1981



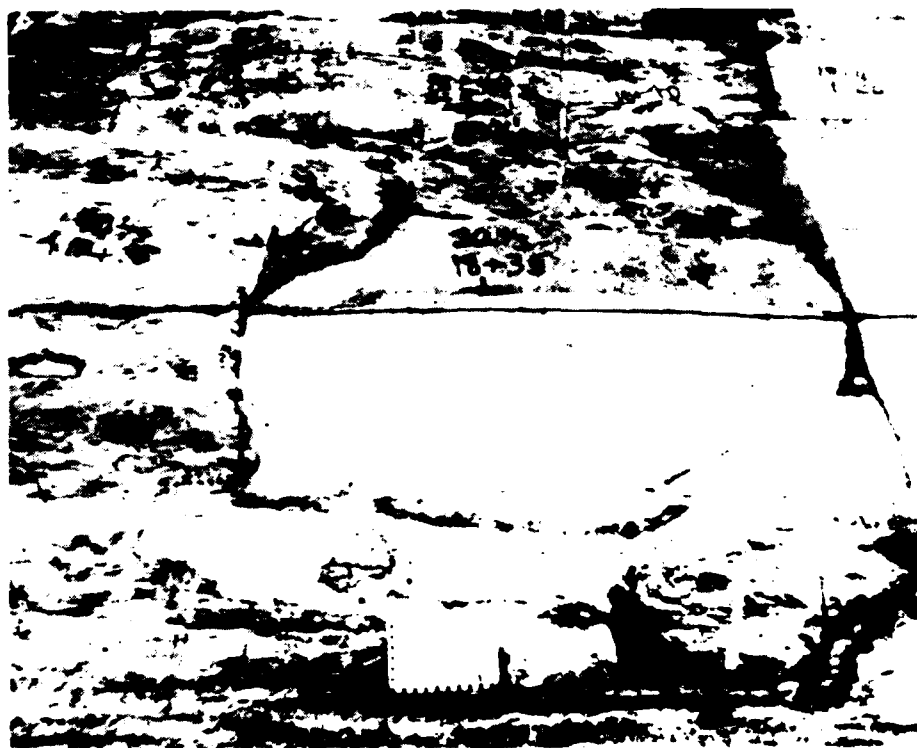
Station 18+25, Offset 175 feet upstream, Elevation 573 feet. Looking upstream at final foundation of embankment protection zone. Diagonal line is downstream limit of embankment protection zone. 20 Aug. 1981.



Station 18+32, Offset 160 feet upstream, Elevation 573 feet. Looking upstream at final foundation of upstream embankment protection zone. Diagonal line is downstream limit of embankment protection zone. 20 Aug. 81



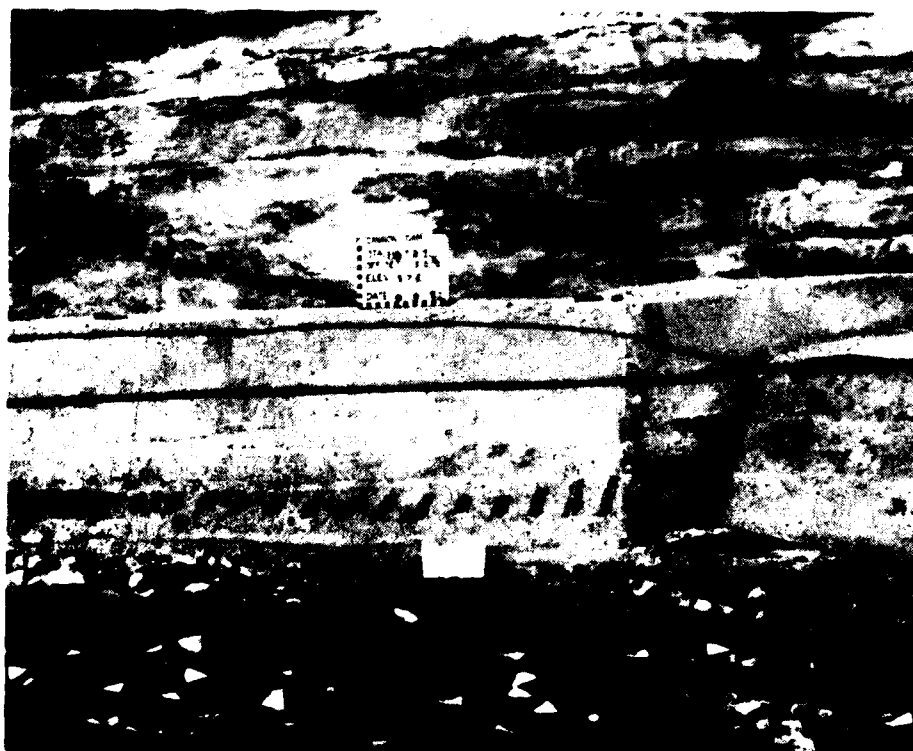
Station 18+32, Offset 75 feet upstream, Elevation 575 feet. Final foundation of pseudocore on left abutment. 10 June 1981.



Station 18+28, Offset 35 feet upstream Elevation 575 feet. Final foundation of pseudocore on left abutment. 10 June 1981.



Station 18+30,, Offset 25 feet downstream, Elevation 575 feet. Final foundation of pseudocore on left abutment. 9 July 1982.



Station 18+27, Offset 50 feet downstream, Elevation 576 feet. Final foundation of pseudocore on left abutment. 9 Sept. 1982.



Station 18+35, Offset 90 feet downstream, Elevation 575 feet. Semi-approved area. Lacks tuckpointing and concrete backfill. 9 Sept. 198



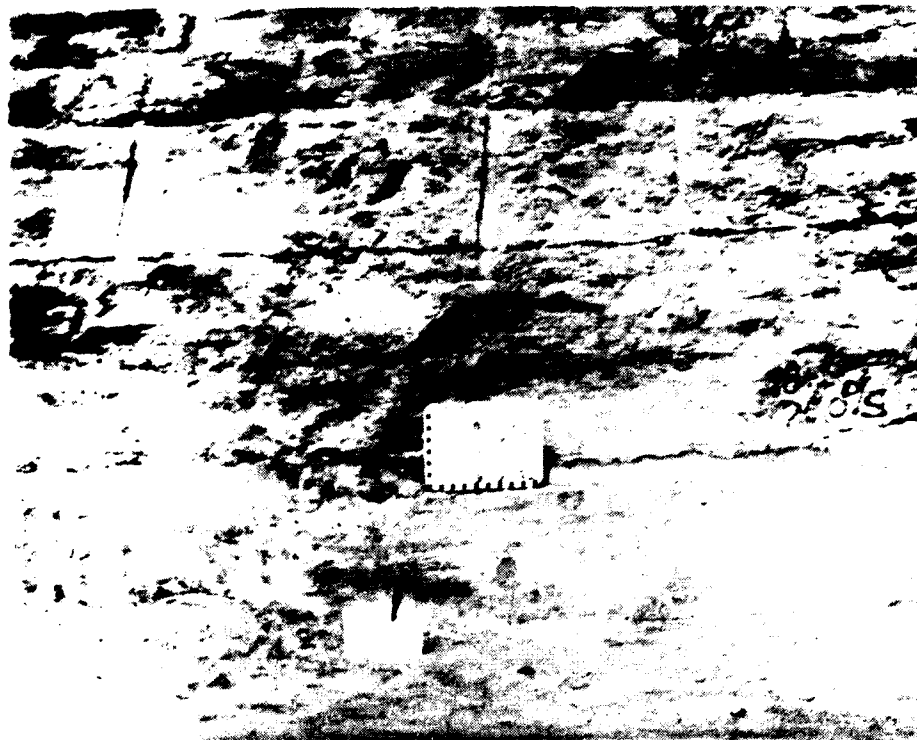
Station 18+12, Offset 120 feet downstream, Elevation 575 feet. Final foundation of left abutment in sand drain zone. 9 Sept. 1982.



Station 18+12, Offset 140 feet downstream, Elevation 575 feet. Final foundation of left abutment in sand drain zone. 9 Sept. 1982.



Station 18+06, Offset 165 feet downstream, Elevation 575 feet. Final foundation of left abutment in sand drain zone. 9 Sept. 1982.



Station 18+10, Offset 195 feet downstream, Elevation 575 feet. Final foundation of left abutment in sand drain zone. 9 Sept. 1982.



Station 18+05, Offset 245 feet downstream, Elevation 575 feet. Final foundation of left abutment in sand drain zone. 9 Sept. 1982.

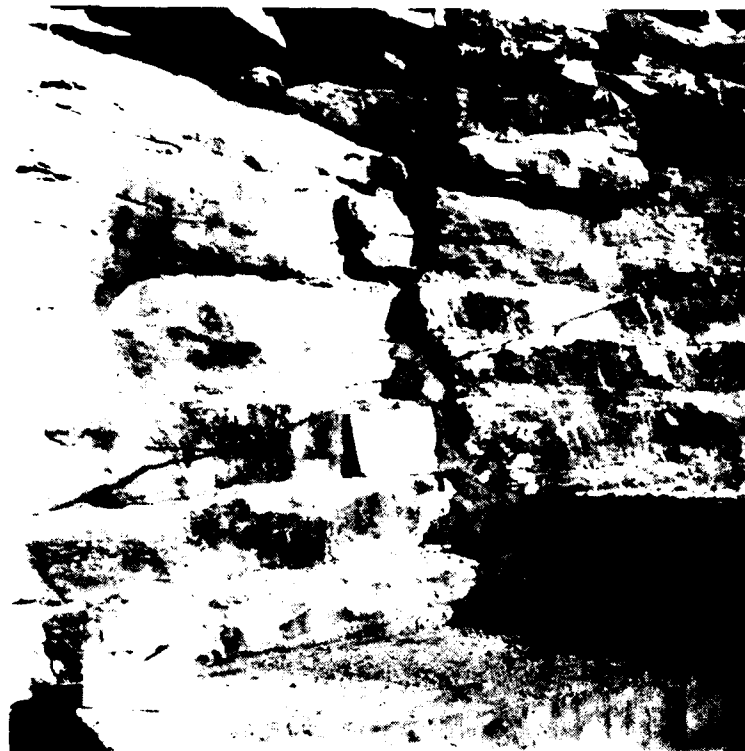


Station 18+05, Offset 300 feet downstream, Elevation 575 feet. Final foundation of left abutment in sand drain zone. 4 Oct. 1982.



Station 17+83, Offset 350 feet downstream, Elevation 575 feet. Final foundation of left abutment in sand drain zone. 9 Sept. 1982.





Station 18+05, Offset 400 feet upstream, Elevation 580 feet. Final foundation of left abutment. Diagonal line represents final template. 20 Oct. 1981.



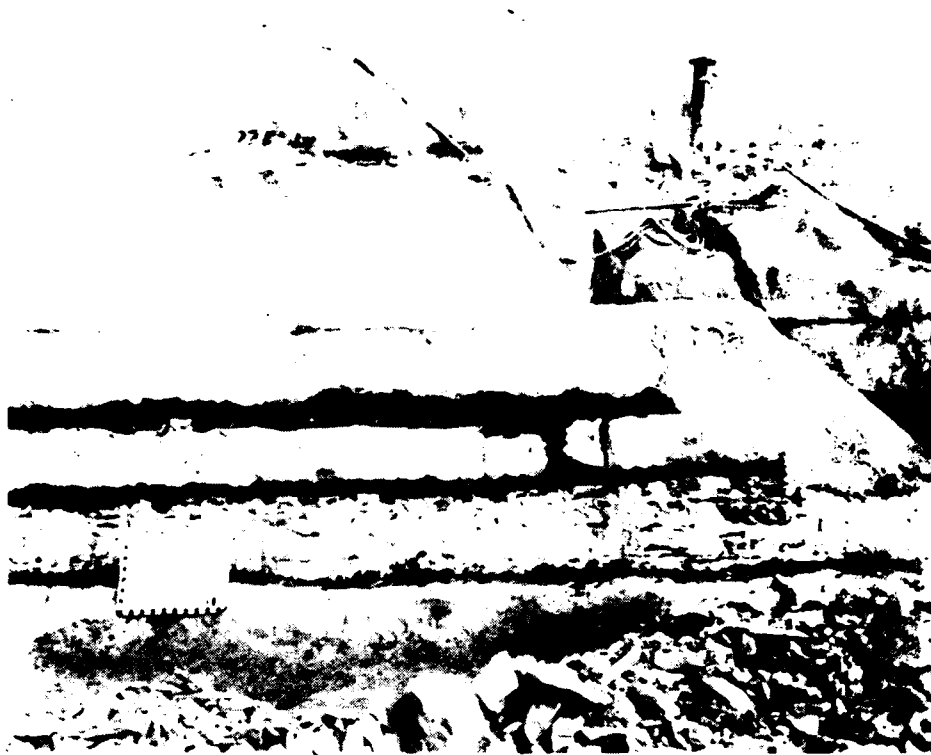
Station 18+00, Offset 350 feet upstream, Elevation 580 feet. Final foundation on left abutment. 20 Oct. 1981.



Station 18+20, Offset 300 feet upstream, Elevation 580 feet. Final foundation on left abutment. 24 June 1982.



Station 18+25, Offset 250 feet upstream. Elevation 580 feet. Final foundation on left abutment. 11 Sept. 1981.



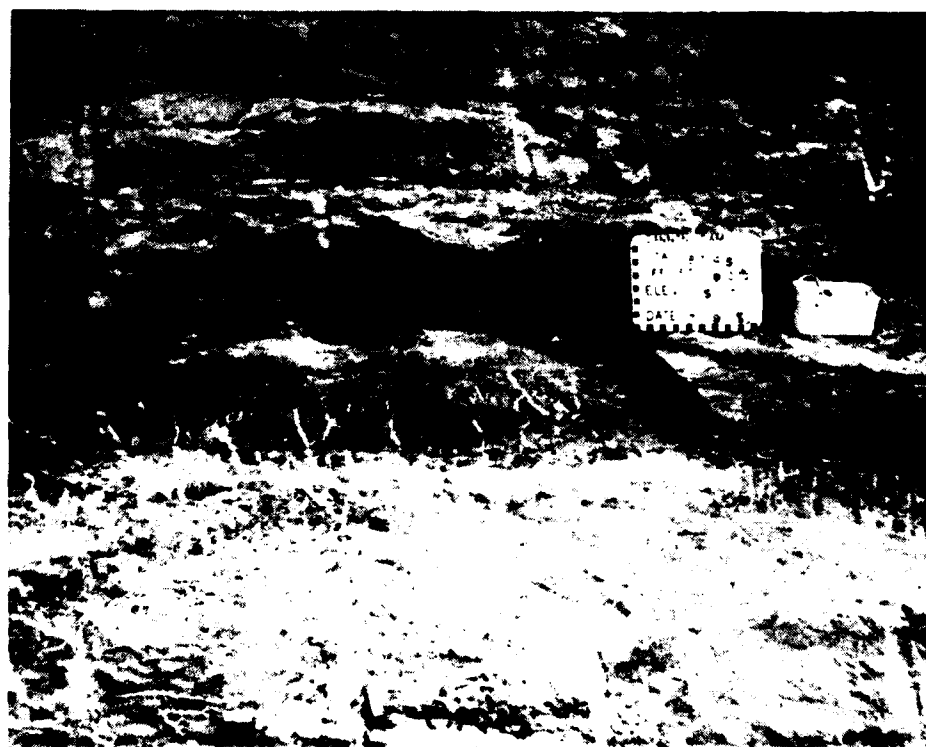
Station 18+25, Offset 225 feet upstream, Elevation 580 feet. Final foundation on left abutment. 11 Sept. 1981.



Station 18+30, Offset 165 feet upstream, Elevation 580 feet. Looking upstream at final foundation on left abutment. 20 Oct. 1981.



Station 18+45, Offset 115 feet upstream, Elevation 580 feet. Final foundation left abutment. 9 July 1982



Station 18+45, Offset 80 feet upstream, Elevation 580 feet. Final foundation left abutment. 9 July 1982



Station 18+40, Offset 30 feet upstream, Elevation 580 feet. Final foundation of pseudocore on left abutment. 8 Sept. 1982.



Station 18+30, Offset 20 feet downstream, Elevation 580 feet. Final foundation of pseudocore on left abutment. 25 Sept. 1982.



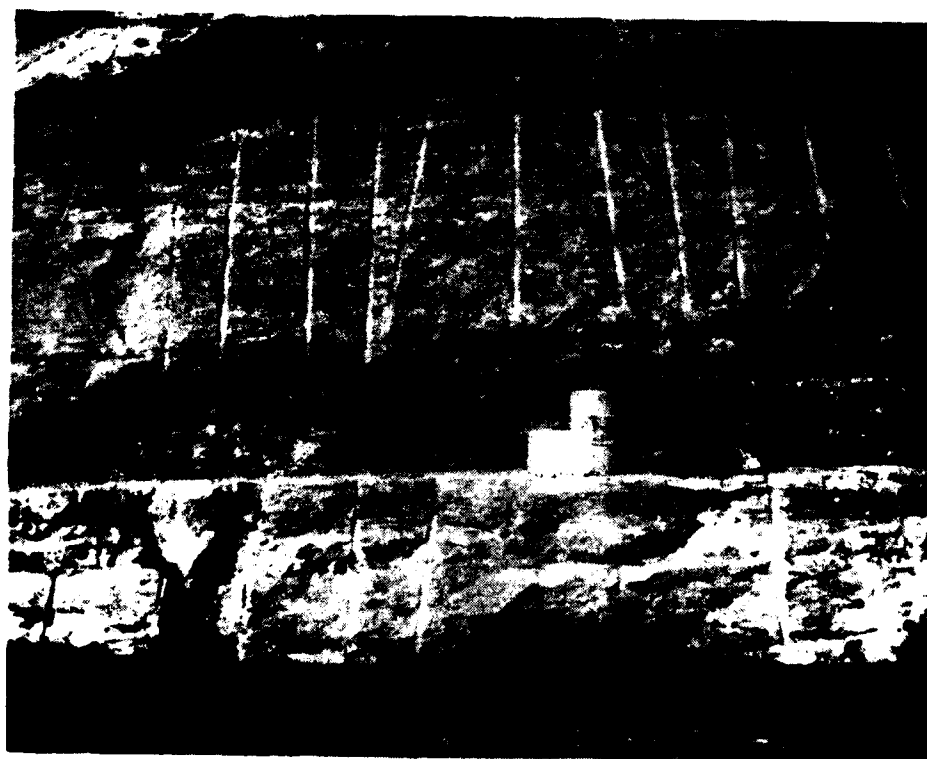
Station 18+30, Offset 50 feet downstream, Elevation 580 feet. Semi-approved area in pseudocore on left abutment. 25 September 1982



Station 18+30, Offset 65 feet downstream, Elevation 580 feet. Semi-approved area in pseudocore on left abutment. Lacks tuckpointing for final approval. 25 September 1982



Station 18+25, Offset 90-125 feet downstream, Elevation 580 feet. Final foundation of left abutment in sand drain zone. 4 Oct. 1982.



Station 18+15, Offset 130-165 feet downstream, Elevation 580 feet. Final foundation of left abutment is sand drain zone. 4 Oct. 1982.

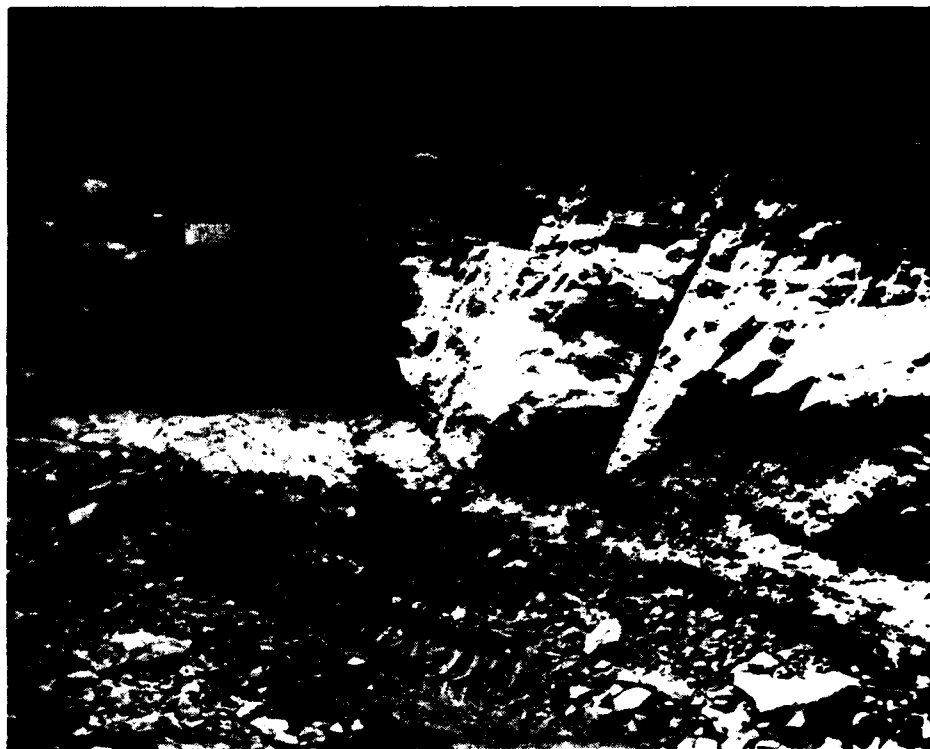


Station 18+15, Offset 175 feet downstream, Elevation 580 feet. Final foundation of left abutment in sand drain zone. 4 Oct. 1982.



Station 18+15, Offset 210 feet downstream, Elevation 580 feet. Final foundation of left abutment in sand drain zone. 7 Nov. 1982.





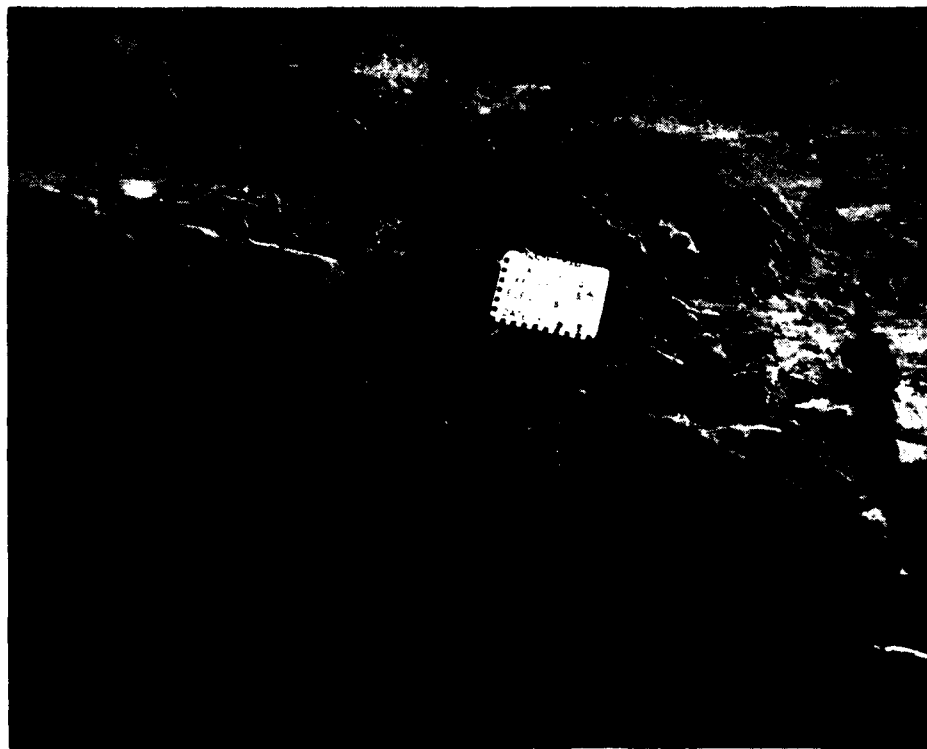
Station 18+20, Offset 361 feet upstream, Elevation 587 feet. Final foundation on left abutment. Diagonal line is final template. 20 July 1



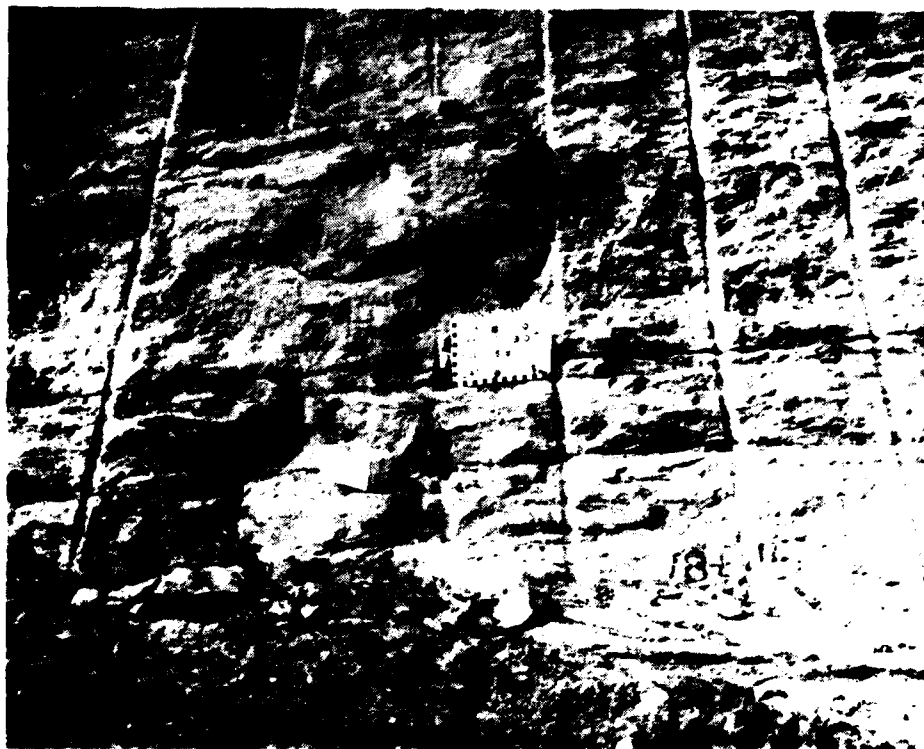
Station 18+20, Offset 325 feet upstream, Elevation 585 feet. Final foundation on left abutment. 24 June 1982.



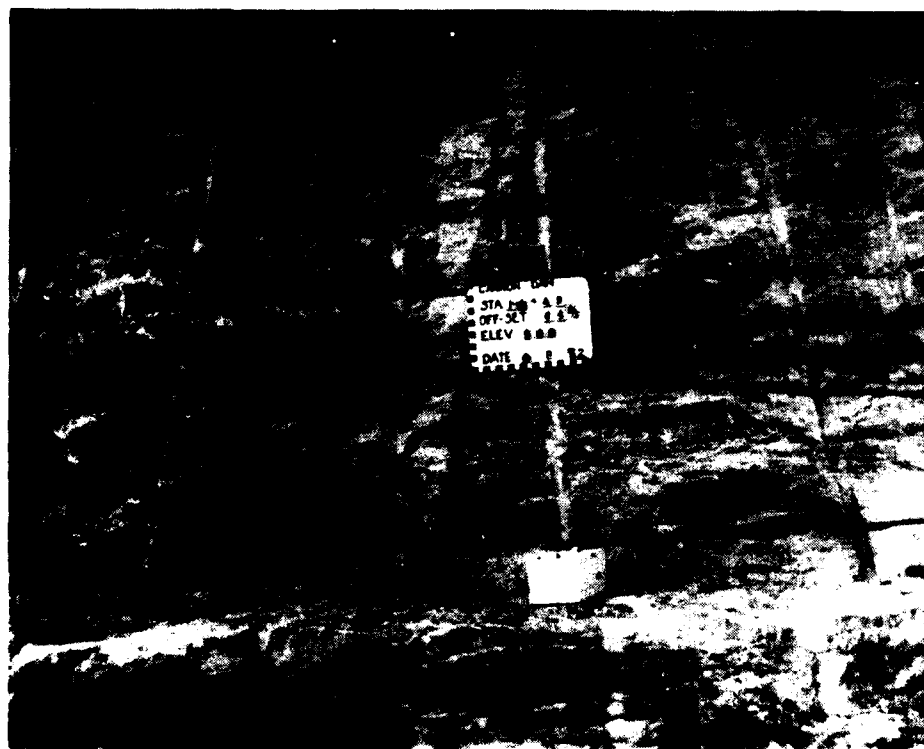
Station 18+30, Offset 235 feet upstream, Elevation 586 feet. Final foundation on left abutment. 15 Sept. 1981.



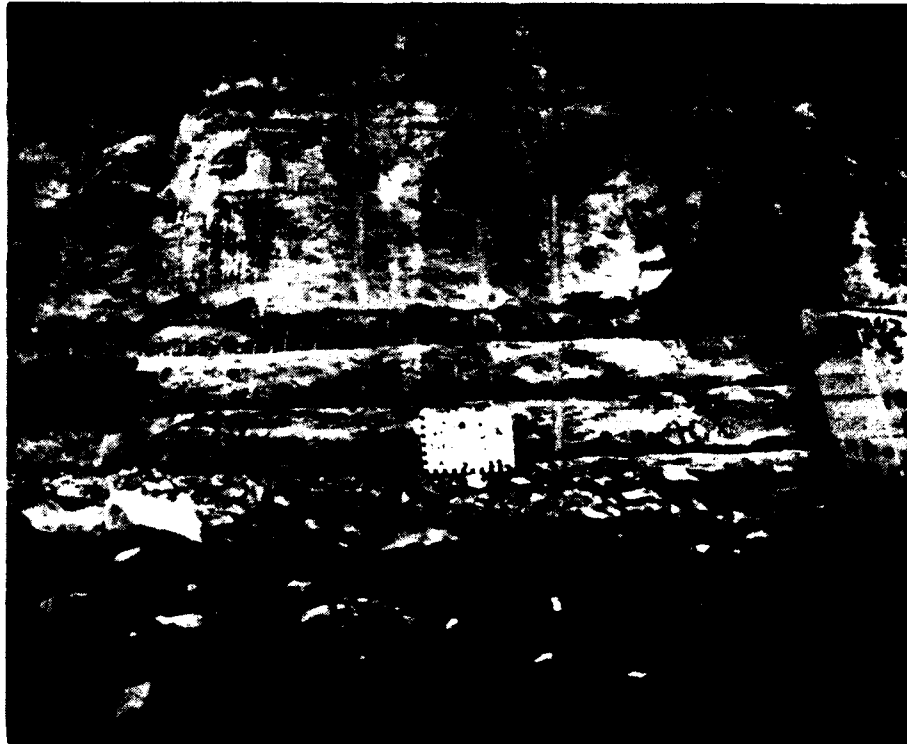
Station 18+40, Offset 175 feet upstream, Elevation 585 feet. Final foundation on left abutment. 9 July 1982.



Station 18+50, Offset 130 feet upstream, Elevation 585 feet. Final foundation on left abutment. 8 Sept. 1982.



Station 18+45, Offset 65 feet upstream, Elevation 583 feet. Final foundation in pseudocore on left abutment. Diagonal line represents upstream limits of pseudocore. 8 Sept. 1982.



Station 18+44, Offset 50 feet upstream, Elevation 583 feet. Final foundation in pseudocore on left abutment. 8 Sept. 1982.



Station 18+40, Offset 30 feet upstream, Elevation 585 feet. Semi-approved foundation in pseudocore on left abutment. Area lacks tuckpointing in veed joints for final approval. 25 Sept. 1982.



Station 18+43, Offset 15 feet downstream, Elevation 585 feet. Final foundation of pseudocore on left abutment. 14 Oct. 1982.



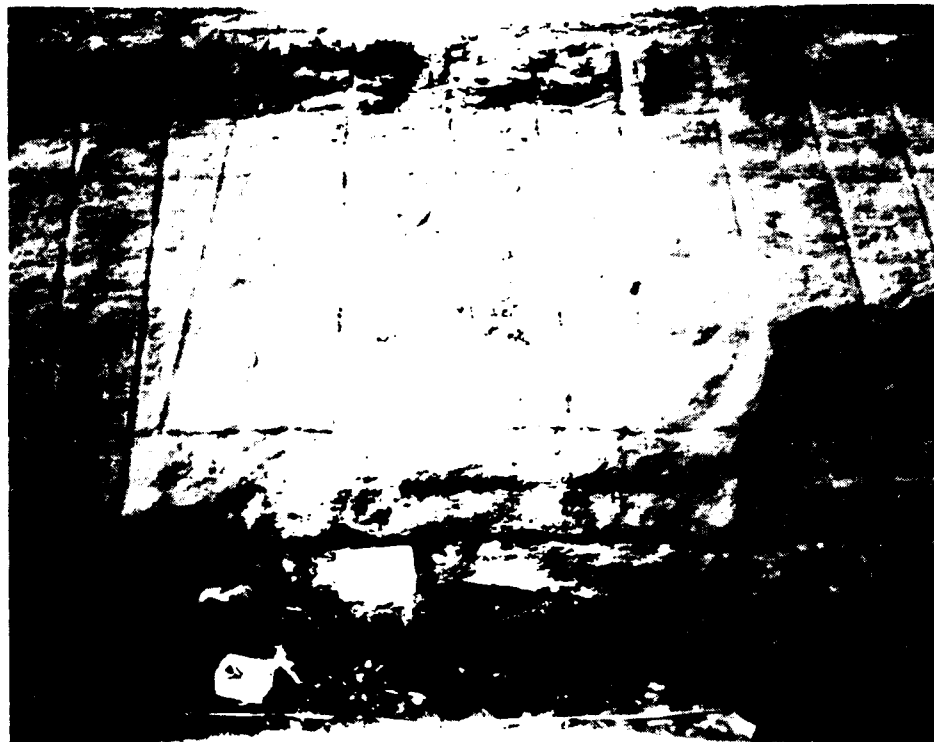
Station 18+45, Offset 50-75 feet downstream, Elevation 585 feet. Final foundation of pseudocore on left abutment. 14 Oct. 1982.



Station 18+45, Offset 75 feet downstream, Elevation 585 feet. Final foundation of pseudocore on left abutment. 14 Oct. 1982.



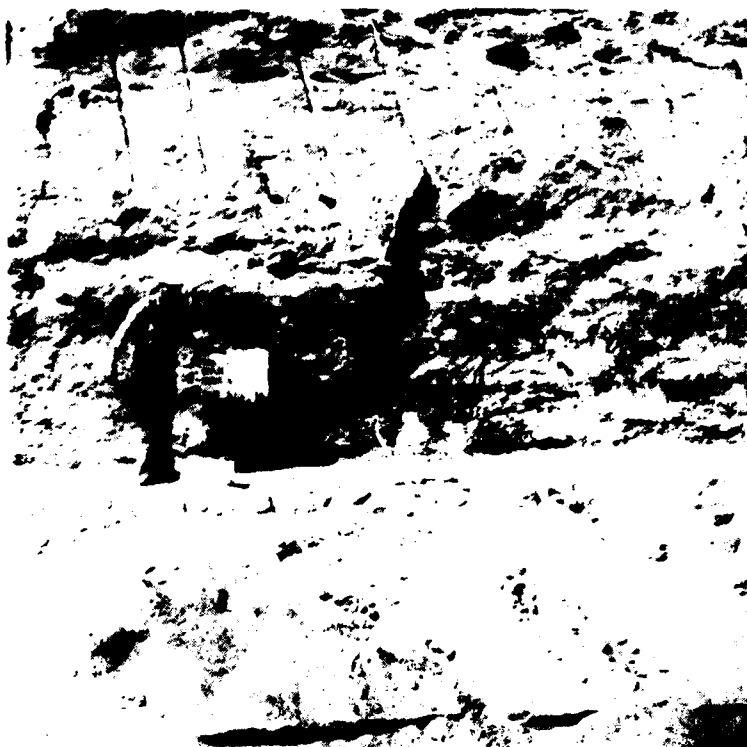
Station 18+25, Offset 110 feet downstream, Elevation 585 feet. Final foundation on left abutment in sand drain zone. 7 Nov. 1982.



Station 18+25, Offset 145 feet downstream, Elevation 585 feet. Final foundation of left abutment in sand drain zone. 7 Nov. 1982.



Station 18+15, Offset 190 feet downstream, Elevation 585 feet. Final foundation of left abutment in sand drain zone. 7 Nov. 1982.



Station 18+25, Offset 200 feet downstream, Elevation 585 feet. Final foundation of left abutment in sand drain zone. 10 May 1983.



Station 18+15, Offset 250 feet downstream, Elevation 585 feet. Final foundation of left abutment in sand drain zone. 10 May 1983.

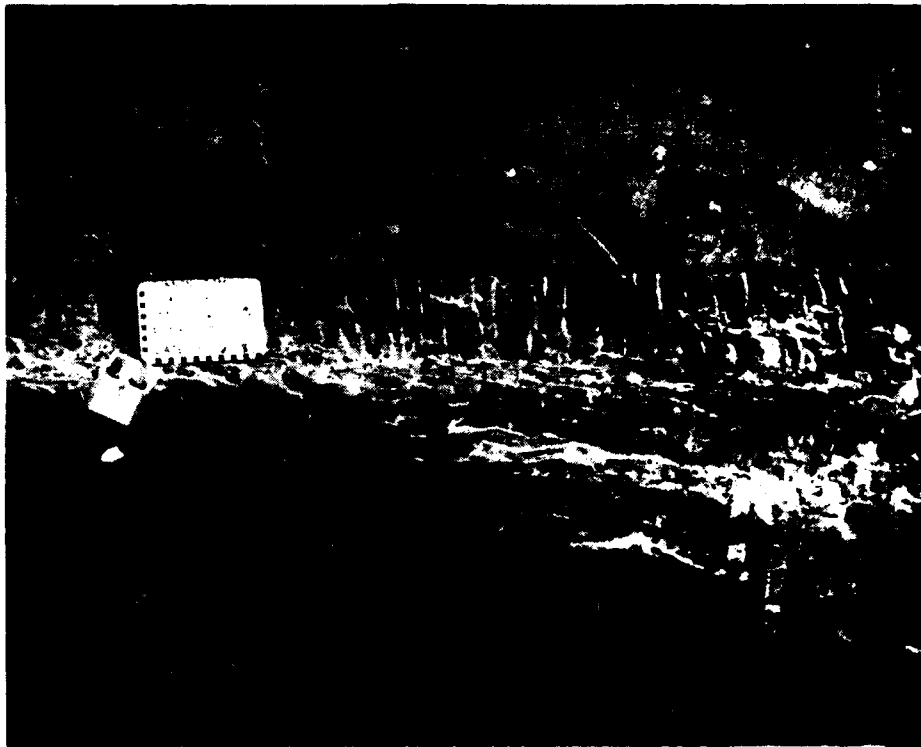




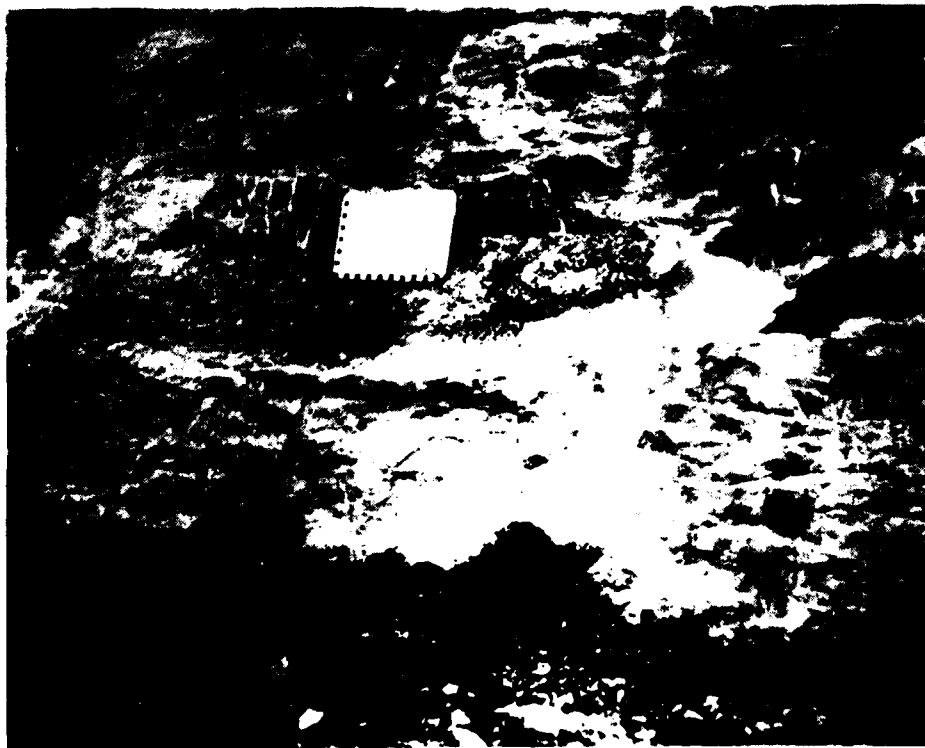
Station 18+20, Offset 325 feet upstream, Elevation 590 feet. Final foundation on left abutment. Slanted line is final template. 20 July 19



Station 18+35, Offset 225 feet upstream, Elevation 589 feet. Final foundation on left abutment. 15 Sept. 1981.



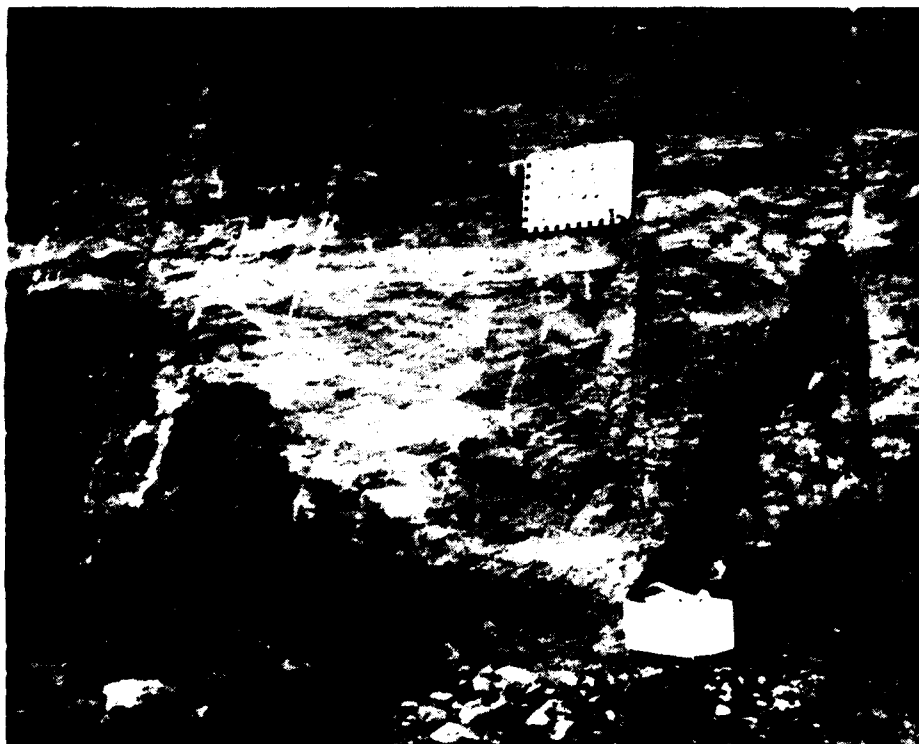
Station 18+45, Offset 200 feet upstream, Elevation 590 feet. Final foundation of left abutment. 9 July 1982



Station 18+45, Offset 170 feet upstream, Elevation 590 feet. Final foundation of left abutment. 11 October 1982



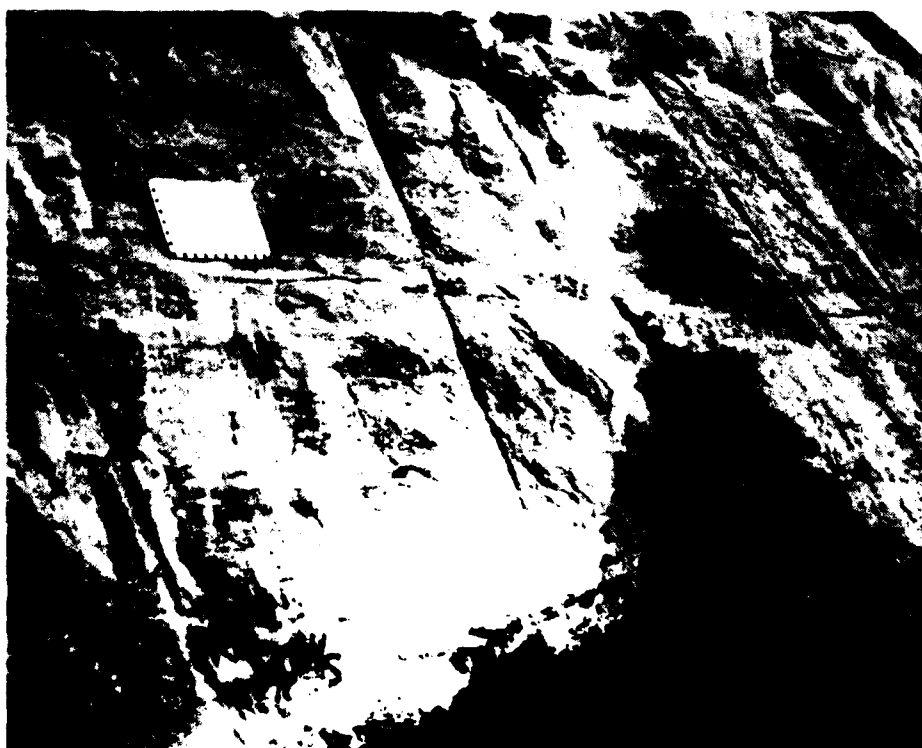
Station 18+50, Offset 150 feet upstream, Elevation 590 feet. Final foundation of left abutment. 11 October 1982



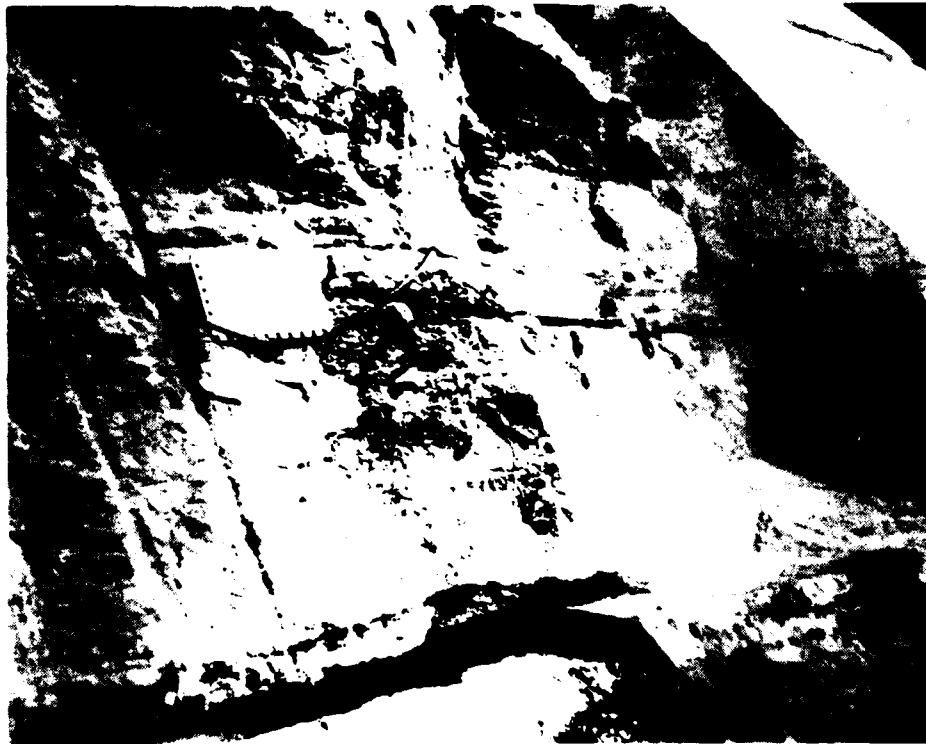
Station 18+55, Offset 130 feet upstream, Elevation 590 feet. Final foundation of left abutment. 11 October 1982



Station 18+55, Offset 95 feet upstream, Elevation 590 feet. Final foundation on left abutment. 11 Oct. 1982.



Station 18+50, Offset 50 feet upstream, Elevation 590 feet. Final foundation of pseudocore on left abutment. 14 Oct. 1982.



Station 18+47, Offset 25 feet upstream, Elevation 590 feet. Final foundation of pseudocore on left abutment. 14 Oct. 1982.



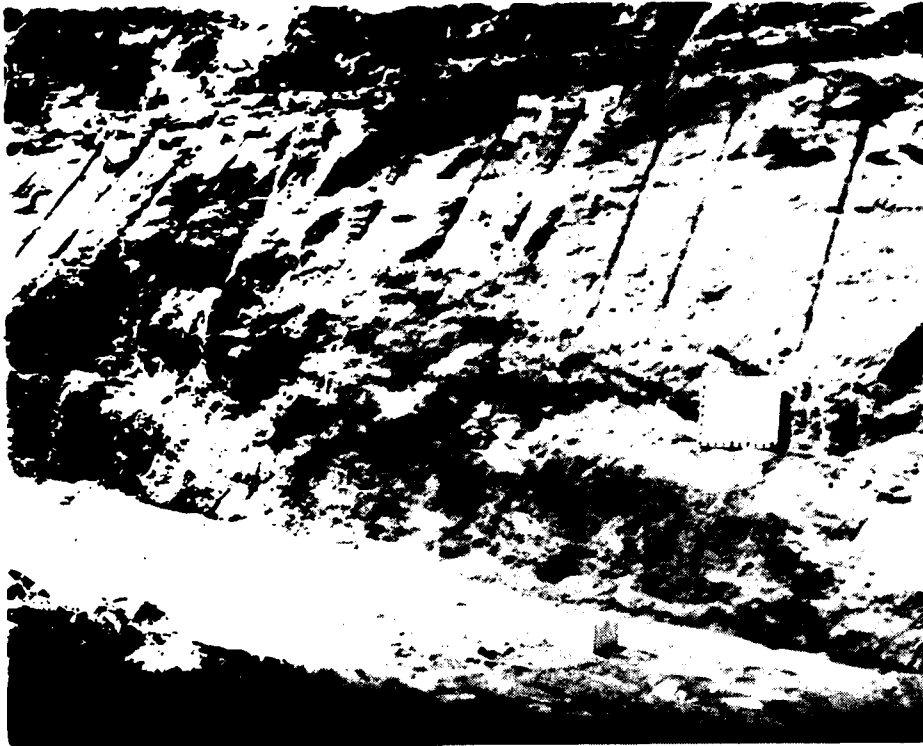
Station 18+45, Offset 15 feet downstream, Elevation 590 feet. Final foundation of pseudocore on left abutment. 28 Oct. 1982.



Station 18+50, Offset 50 feet downstream, Elevation 590 feet. Final foundation of pseudocore on left abutment. 28 Oct. 1982.



Station 18+50, Offset 90 feet downstream, Elevation 590 feet. Final foundation of pseudocore on left abutment. Slanted line represents fill/sand filter interface. 28 Oct. 1982.



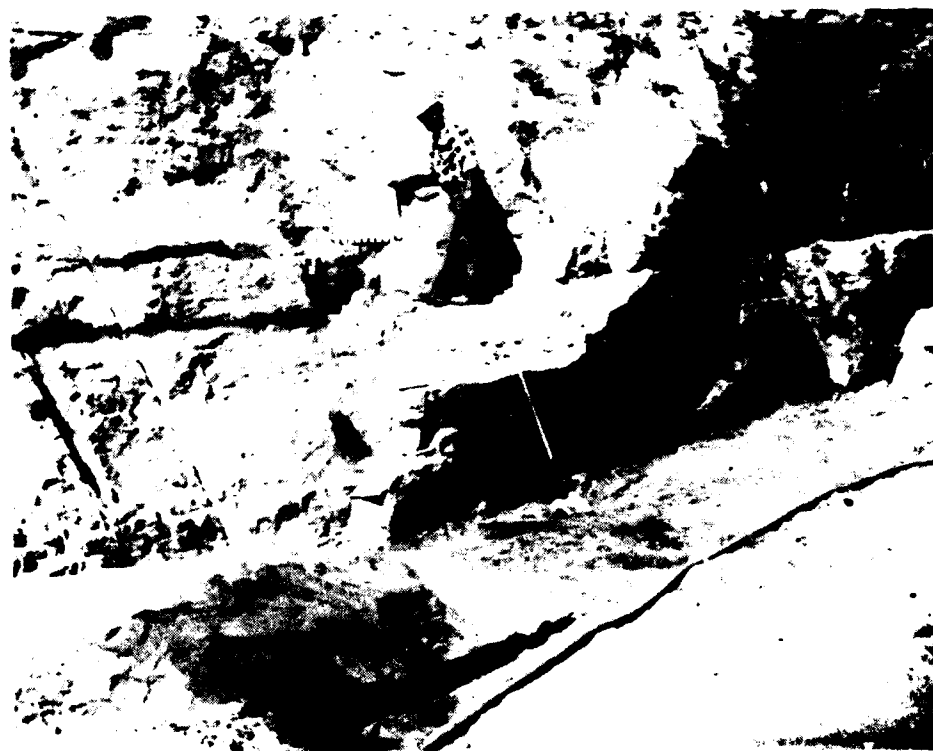
Station 18+25, Offset 200 feet downstream, Elevation 590 feet. Final foundation of left abutment in sand drain zone. 5 June 1983.



Station 18+25, Offset 225 feet downstream, Elevation 590 feet. Final foundation of left abutment in sand drain zone. Slanted line represents final template for left abutment sand filter drain. 5 June 1983.

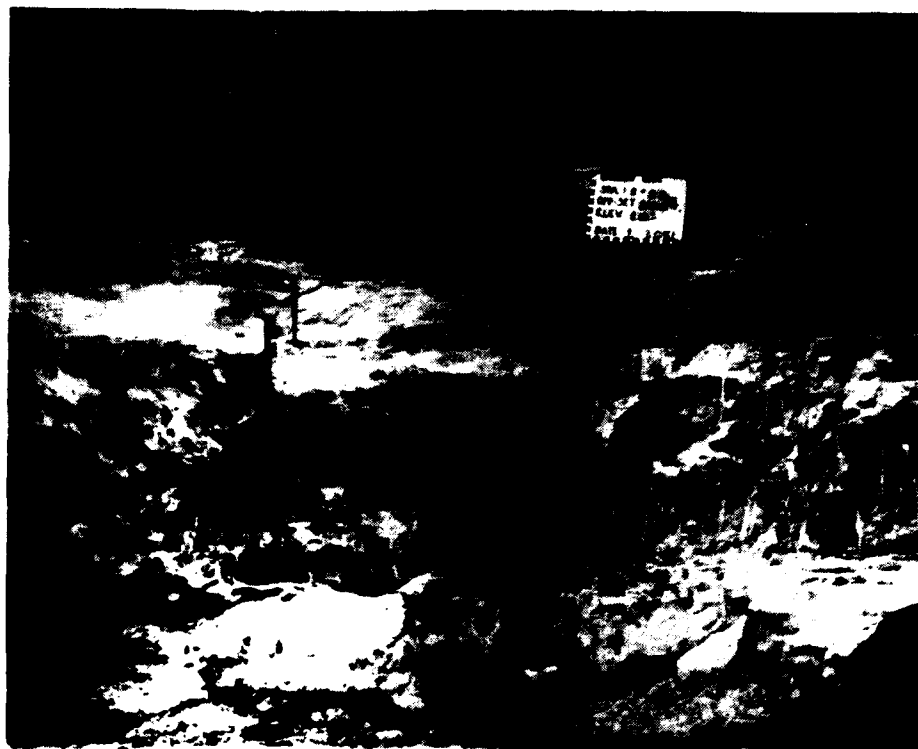


Station 18+20, Offset 250 feet downstream, Elevation 590 feet. Final foundation of left abutment in sand drain zone. Upper slanted line is final template for earthen embankment. Lower slanted line is final template for left abutment sand filter drain. 5 June 1983.



Station 18+15, Offset 310 feet downstream. Elevation 589 feet. Final foundation of left abutment in sand drain zone. 10 May ,983.





Station 18+28, Offset 290 feet upstream, Elevation 595 feet. Final foundation of left abutment. Slanted line represents final template for earthen embankment. 20 July 1982.



Station 18+35, Offset 255 feet upstream, Elevation 595 feet. Final foundation of left abutment. 20 July 1982.



Station 18+25, Offset 215 feet upstream, Elevation 594 feet. Final foundation of left abutment. 21 July 1982.



Station 18+50, Offset 35 feet upstream, Elevation 595 feet. Final foundation of pseudocore on left abutment. 28 Oct. 1982.



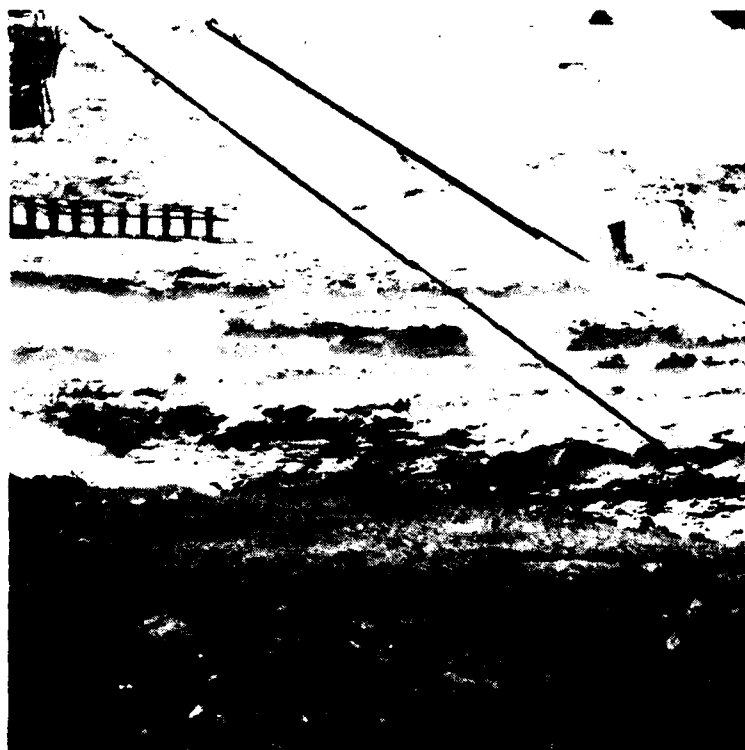
Station 18+54, Offset 15 feet upstream. Elevation 595 feet. Final foundation of pseudocore on left abutment. 28 Oct. 1982.



Station 18+60, Offset 25 feet downstream, Elevation 595 feet. Final foundation of pseudocore on left abutment. 26 May 1983.



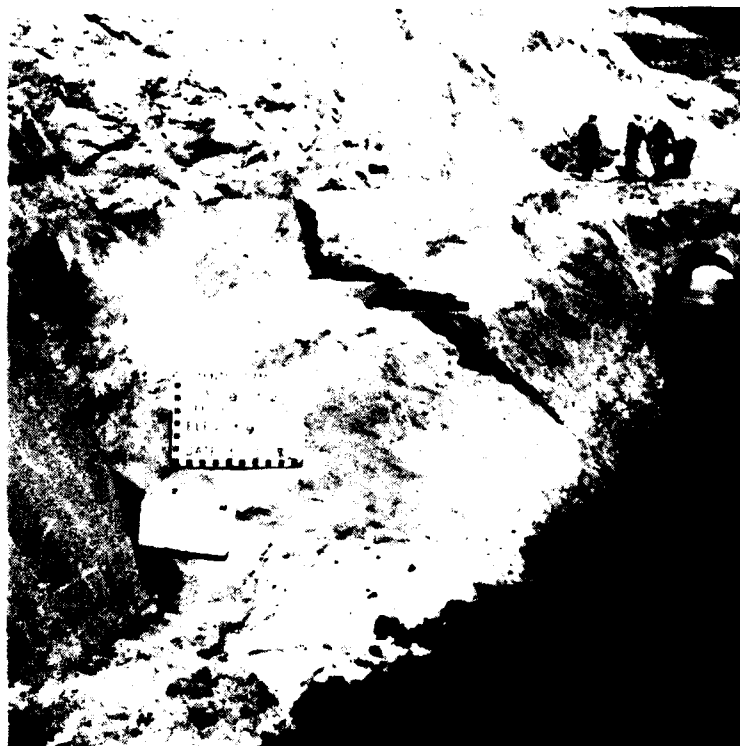
Station 18+58, Offset 50 feet downstream, Elevation 594 feet. Final foundation of pseudocore on left abutment. 10 May 1983.



Station 18+58, Offset 70 feet downstream, Elevation 594 feet. Final foundation of pseudocore on left abutment. Slanted line on right is final template for sand drain, slanted line on left is downstream limit of pseudocore. 10 May 1983.



Station 18+45, Offset 230 feet upatream, Elevation 598 feet. Final foundation on left abutment. 6 May 1983.



Station 18+52, Offset 175 feet upstream, Elevation 597 feet. Final foundation on left abutment. 6 May 1983.



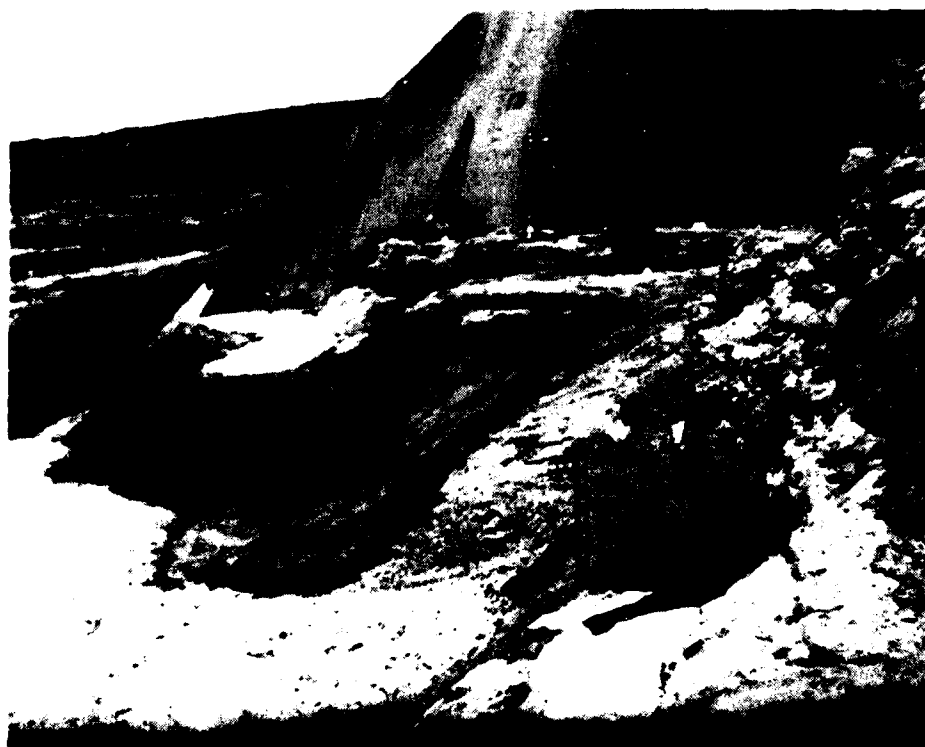
Station 18+60, Offset 65 feet upstream, Elevation 600 feet. Final foundation on left abutment. Vertical line is upstream limit of pseudocore. 6 May 1983.



Station 18+62, Offset 36 feet upstream, Elevation 600 feet. Final foundation of pseudocore on left abutment. 9 May 1983.



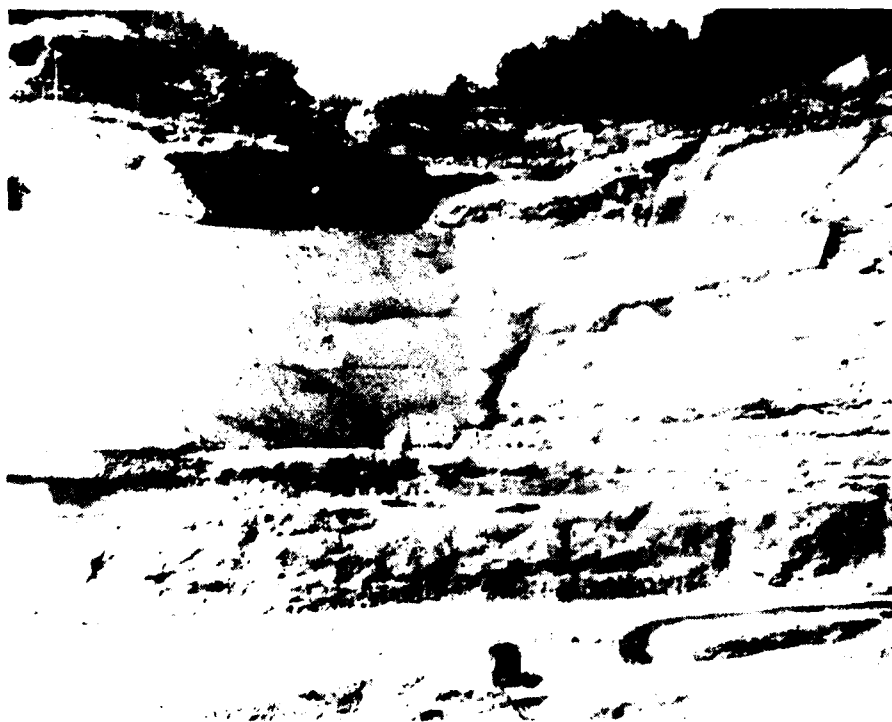
Station 18+62, Offset 20 feet upstream, Elevation 600 feet. Final foundation of pseudocore on left abutment. 9 May 1983.



Station 18+80, Offset 65 feet downstream, Elevation 600 feet. View upstream of final foundation of pseudocore on left abutment. 26 May 1983



Station 18+80, Offset 70 feet downstream, Elevation 600 feet. Final foundation of left abutment. Slanted line on left is downstream limits of pseudocore, and slanted line on right is upstream limit of sand filter drain. 26 May 1983.



Station 18+80, Offset 100 feet downstream, Elevation 600 feet. Final foundation of left abutment in sand drain zone. 15 June 1983.





Station 18+50, Offset 125 feet downstream, Elevation 600 feet. Final foundation of left abutment in sand drain zone. 16 June 1983.



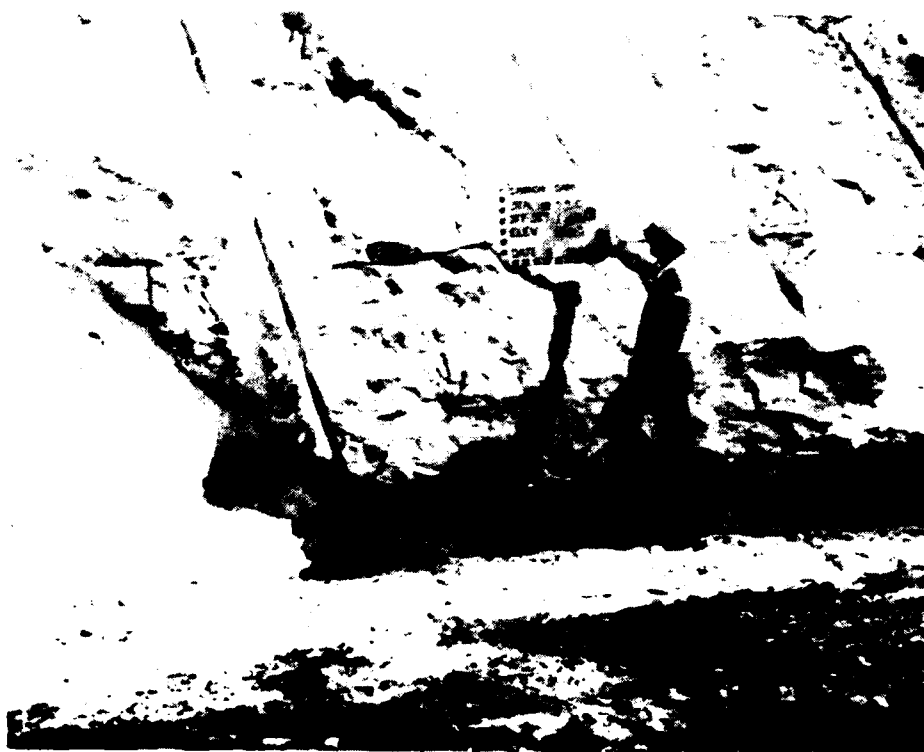
Station 18+50, Offset 150 feet downstream, Elevation 600 feet. Final foundation of left abutment in sand drain zone. 24 June 1983.



Station 18+35, Offset 220 feet downstream, Elevation 600 feet. Final foundation of left abutment in sand drain zone. 24 June 1983.



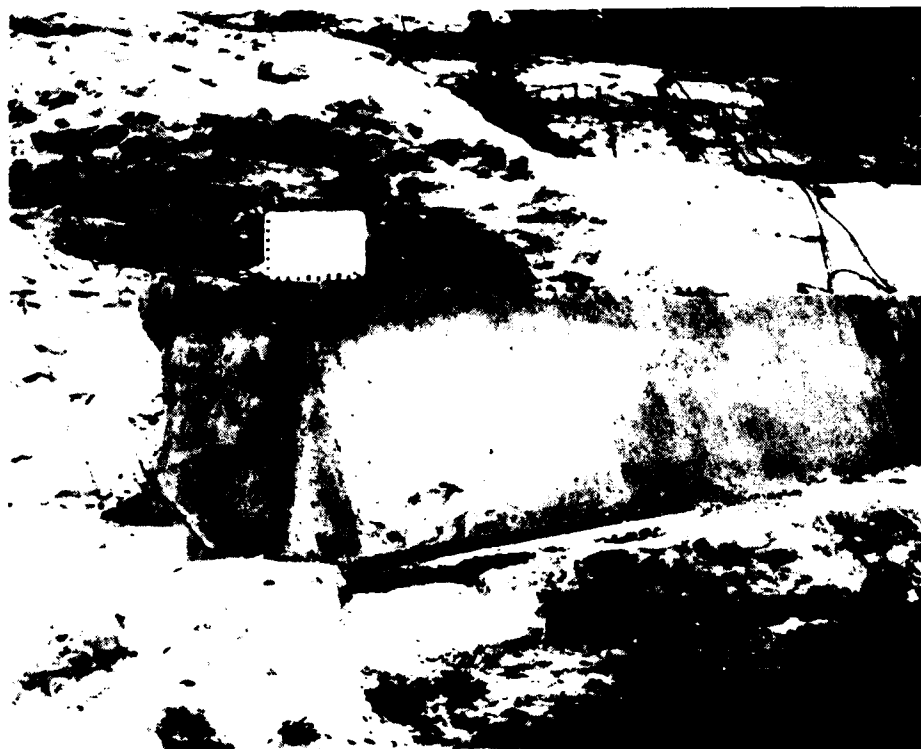
Station 18+65, Offset 135 feet upstream, Elevation 605 feet. Final foundation on left abutment. 21 May 1983.



Station 18+70, Offset 100 feet upstream, Elevation 605 feet. Final foundation of left abutment. 23 May 1983.



Station 18+70, Offset 75 feet upstream, Elevation 605 feet. Final foundation of left abutment. 23 May 1983



Station 18+63, Offset 40 feet upstream, Elevation 605 feet. Final foundation of pseudocore on left abutment. 26 May 1983



Station 18+81, Offset 25 feet downstream, Elevation 605 feet. Final foundation of pseudocore on left abutment. 11 June 1983.



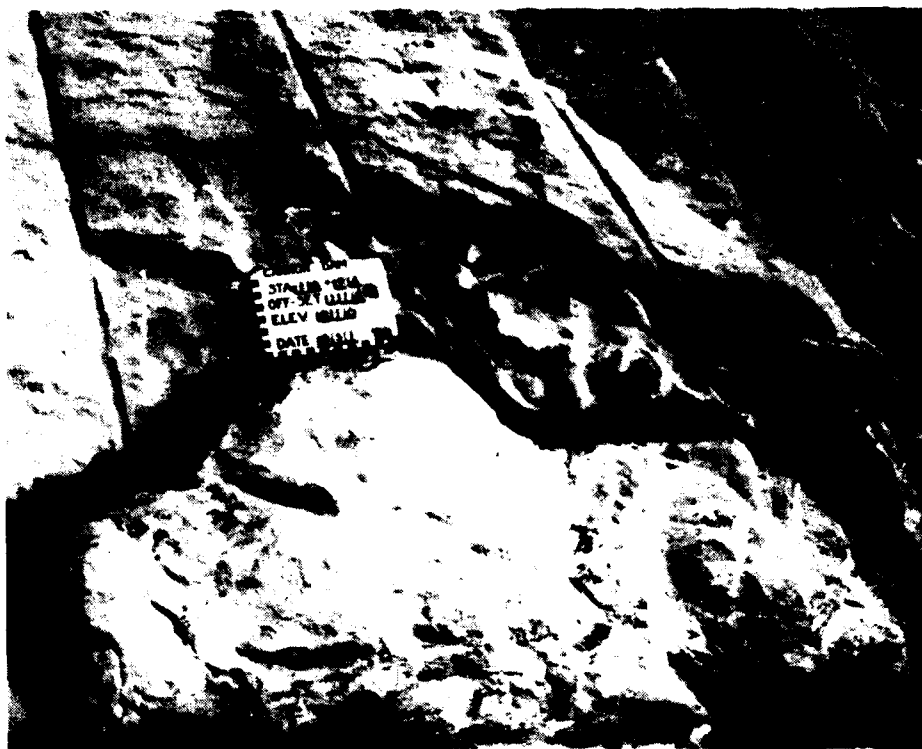
Station 18+83, Offset 50 feet downstream, Elevation 605 feet. Final foundation of pseudocore on left abutment. Slanted line represents downstream limit of pseudocore. 11 June 1983.



Station 18+45. Offset 140 feet downstream. Elevation 605 feet. Final foundation of left abutment in sand drain zone. 6 July 1983.



Station 18+35. Offset 175 feet downstream. Elevation 605 feet. Final foundation of left abutment in sand drain zone. Diagonal line represents final template of embankment. 6 July 1983.



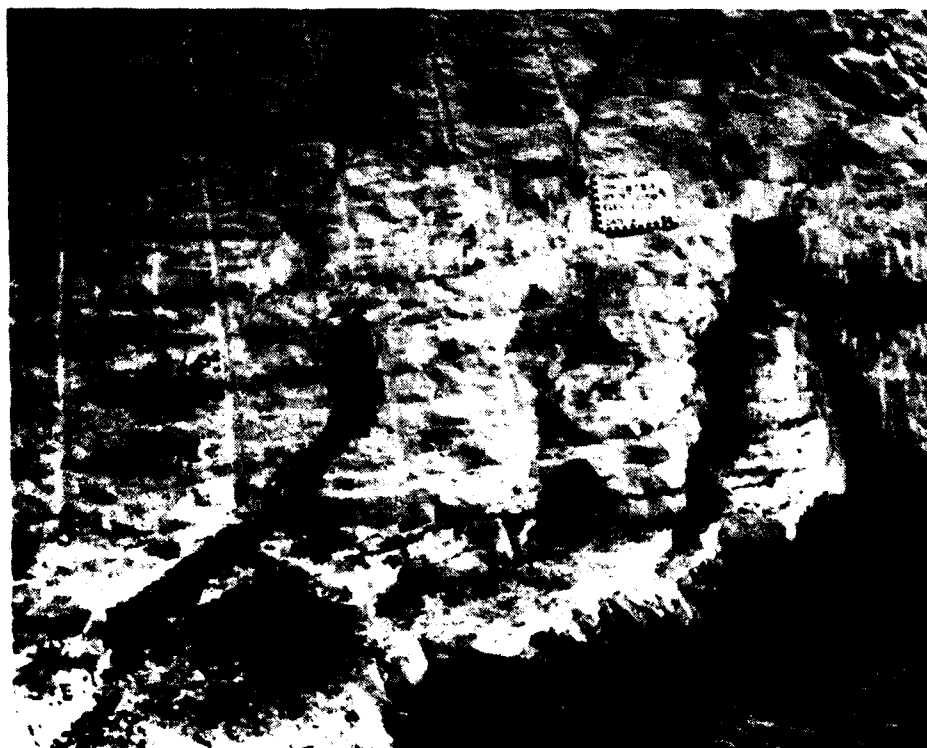
Station 18+74, Offset 115 feet upstream, Elevation 610 feet. Final foundation of left abutment. 31 May 1983



Station 18+75, Offset 85 feet upstream, Elevation 610 feet. Final foundation of left abutment. 18 June 1983



Station 18+75, Offset 35 feet upstream, Elevation 610 feet. Final foundation of pseudocore on left abutment. 18 June 1983.



Station 18+55, Offset 140 feet downstream, Elevation 610 feet. Final foundation of left abutment in sand drain zone. 11 July 1983.





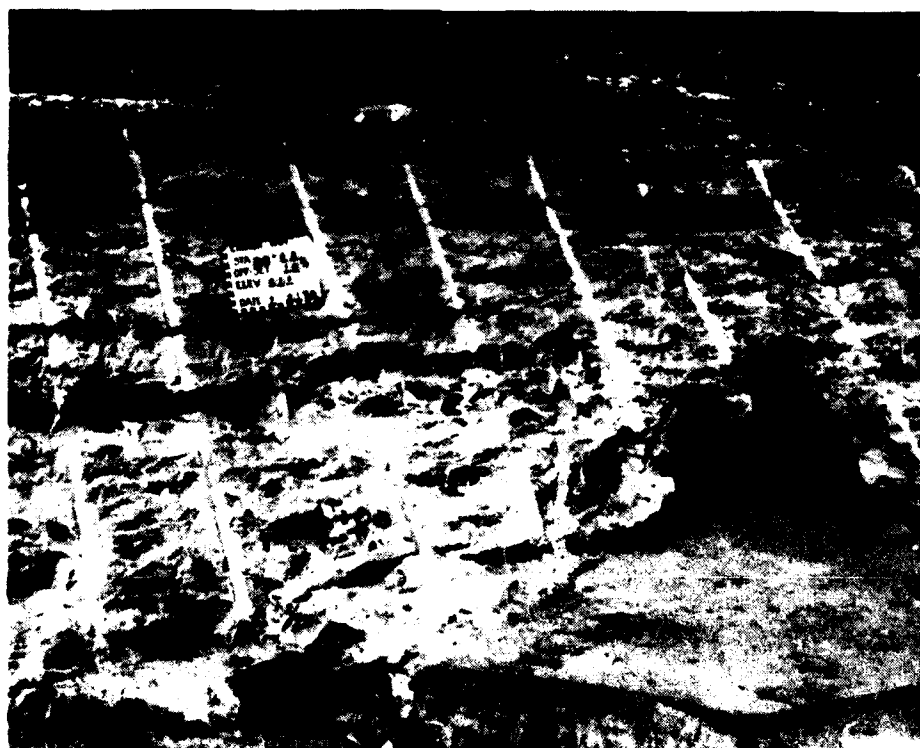
Station 18+80, Offset 80 feet upstream, Elevation 615 feet. Final foundation of left abutment. 7 July 1983.



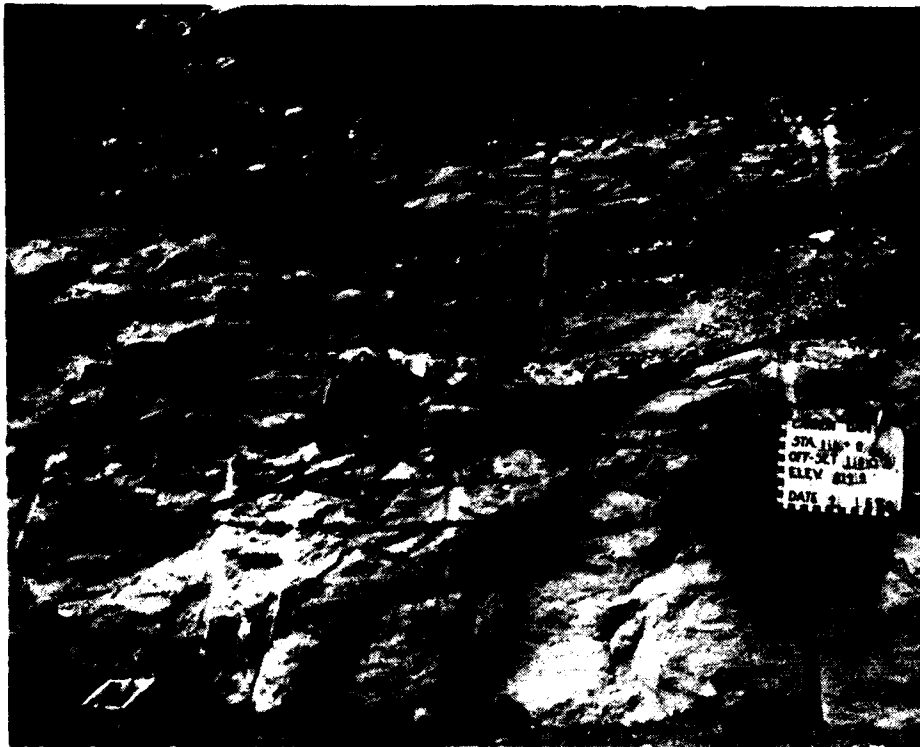
Station 18+75, Offset 60 feet upstream, Elevation 615 feet. Final foundation of left abutment. 7 July 1983.



Station 19+05, Offset 60 feet downstream, Elevation 610 feet. Final foundation of left abutment. Slanted line represents filter sand/embankment interface. 21 July 1983.



Station 19+05, Offset 75 feet downstream, Elevation 615 feet. Final foundation of left abutment in sand drain zone. 21 July 1983.



Station 18+80, Offset 150 feet upstream, Elevation 620 feet. Final foundation of left abutment. Diagonal line represents final template of embankment fill. 16 July 1983.



Station 18+92, Offset 54 feet upstrea, Elevation 620 feet. Final foundation of left abutment. Note dry pack at base of fillet. 20 July 1983.



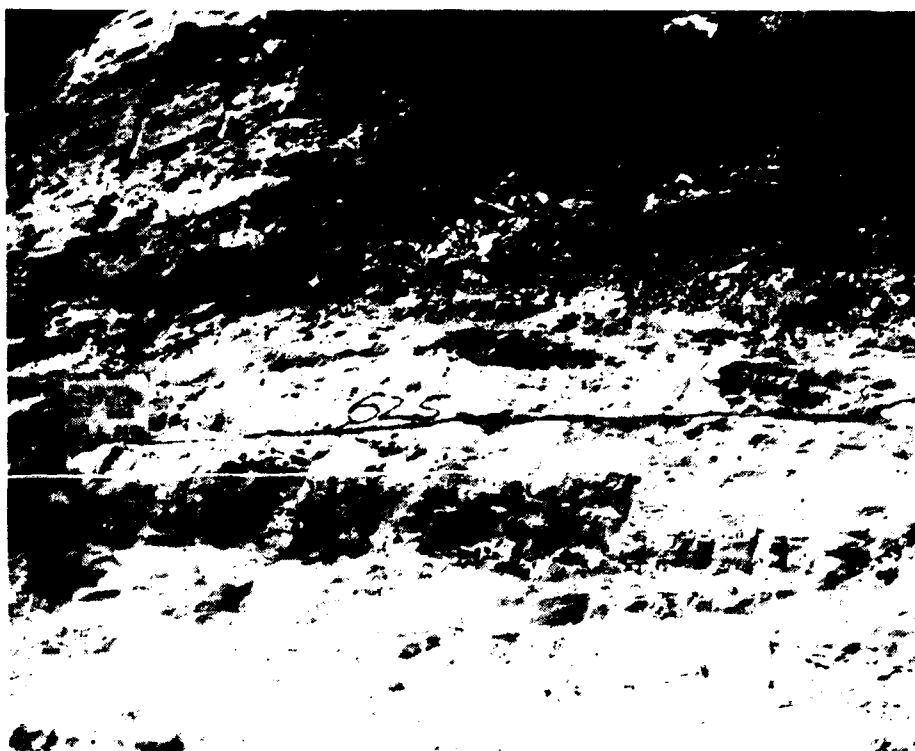
Station 18+95, Offset 25 feet upstream, Elevation 620 feet. Final foundation of pseudocore on left abutment. Picture shows general condition of upper Burlington Formation. (chert lenses and thin bedding planes). The rock did not improve in depth during treatment. 16 July 1983.



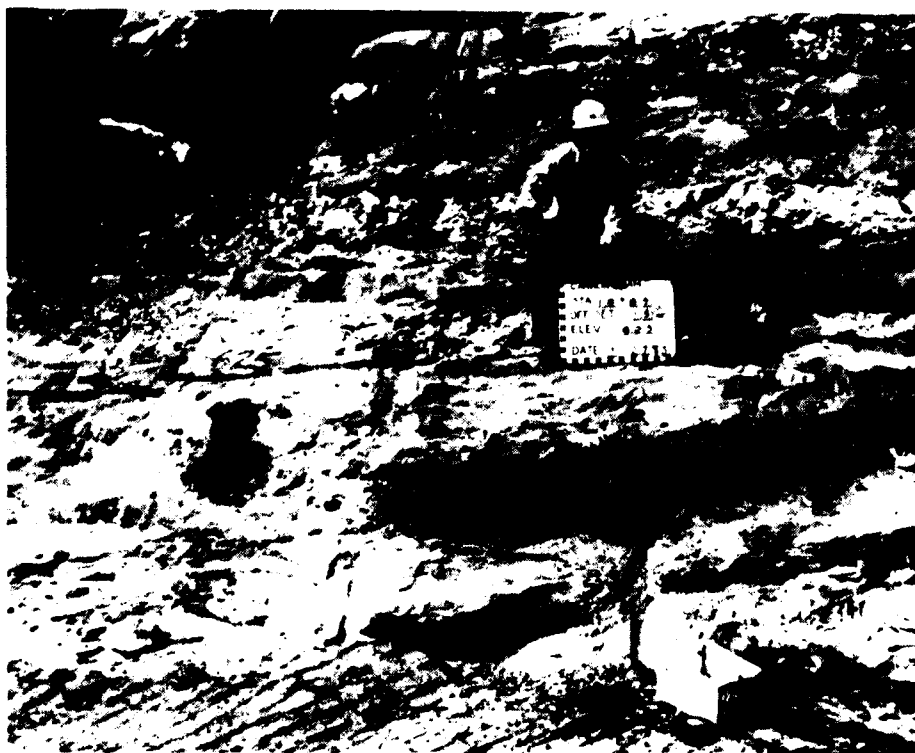
Final foundation of elevation 620 feet bench in sand drain zone. Bench extended from approximately 35- 110 feet downstream. 6 Aug. 1983.



Final foundation of elevation 620 feet bench in sand drain zone. View is downstream. Final template is where laborer with shovel is standing. 6 Aug. 1983.



Station 18+90, Offset 110 feet upstream, Elevation 625 feet. Final foundation of left abutment. 27 July 1983.



Station 18+89, Offset 75 feet upstream, Elevation 625 feet. Final foundation of left abutment. 27 July 1983.



Station 19+70, Offset 50 feet downstream, Elevation 625 feet. Final foundation of left abutment in sand drain zone. Diagonal line represents final template of embankment. 6 Aug. 1983.

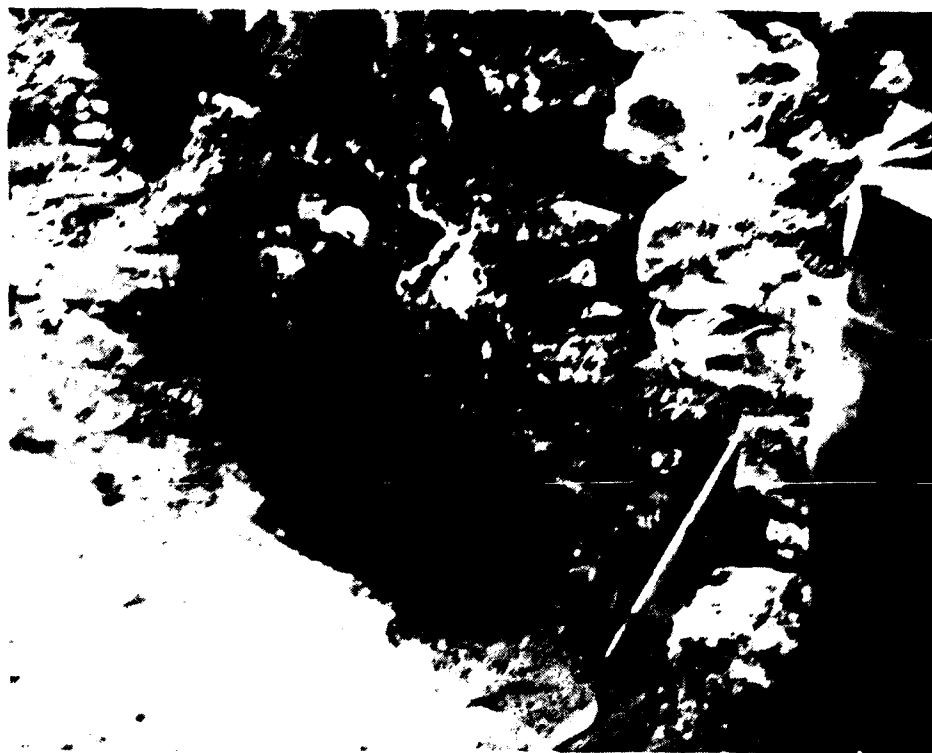


Area of solutioning on left abutment at approximate elevation 630 feet. Area extended from 40-70 feet upstream along a joint plane.

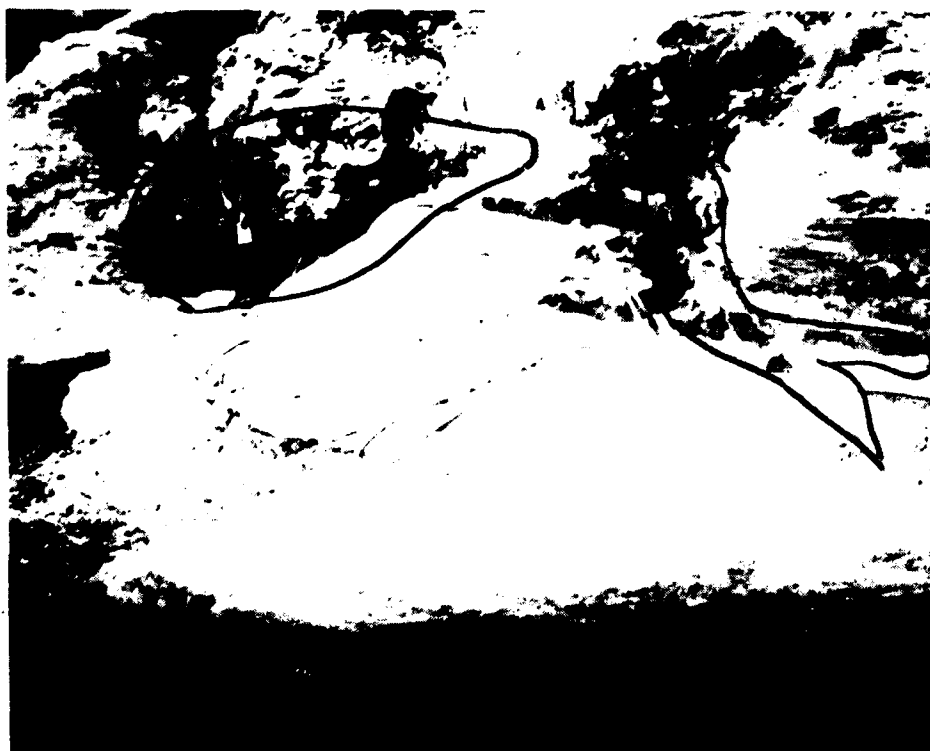


Laborer cleaning out partially clay filled joint. Area was subsequently backfilled with concrete.

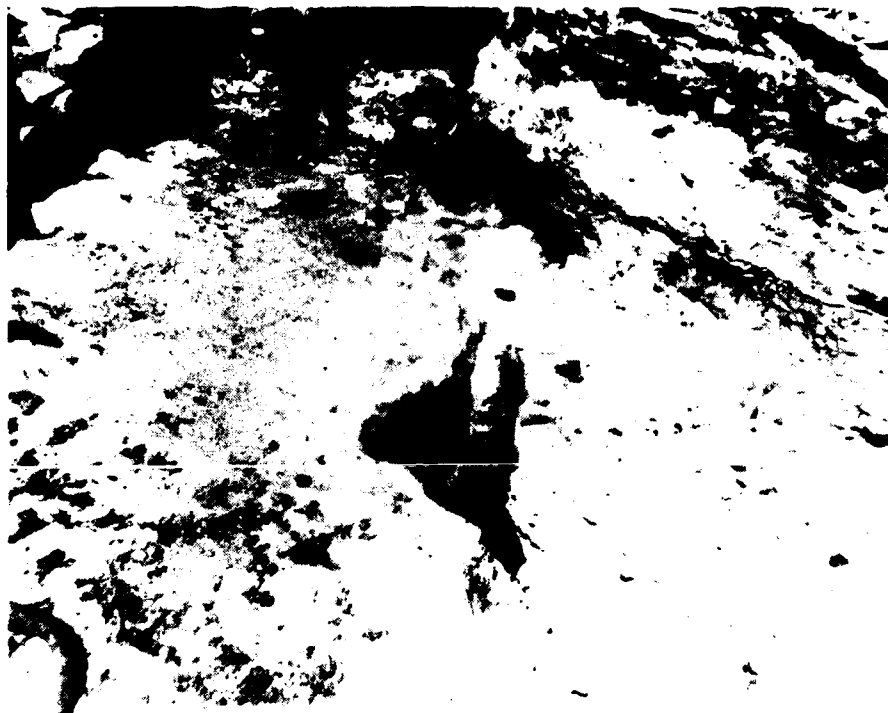




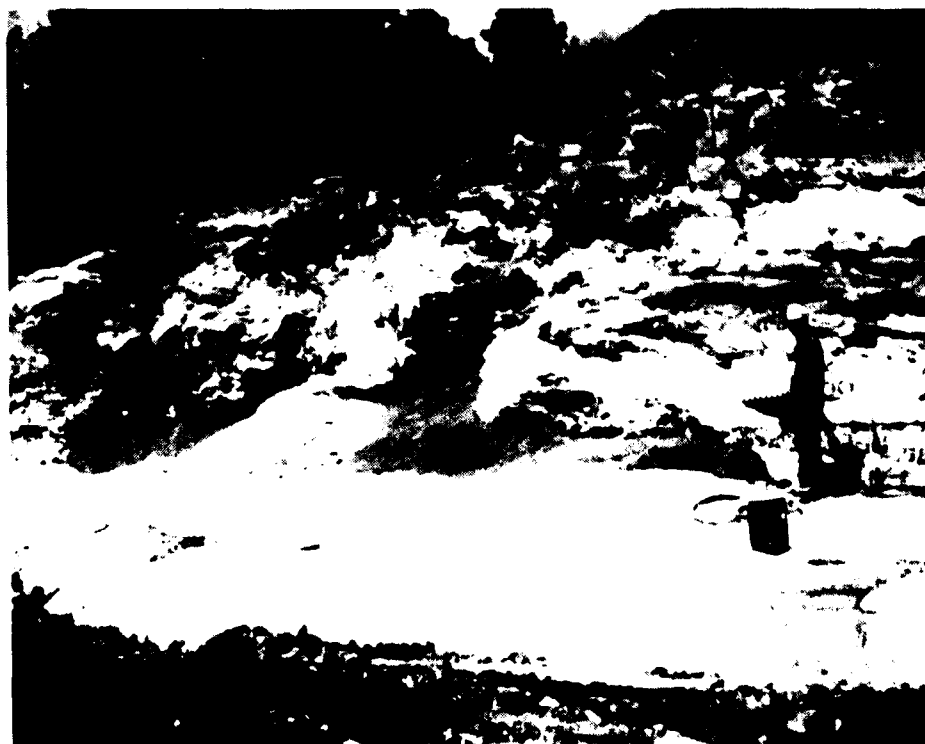
Solutioned joint after receiving treatment. This portion of joint was clay-filled and was backfilled with concrete.



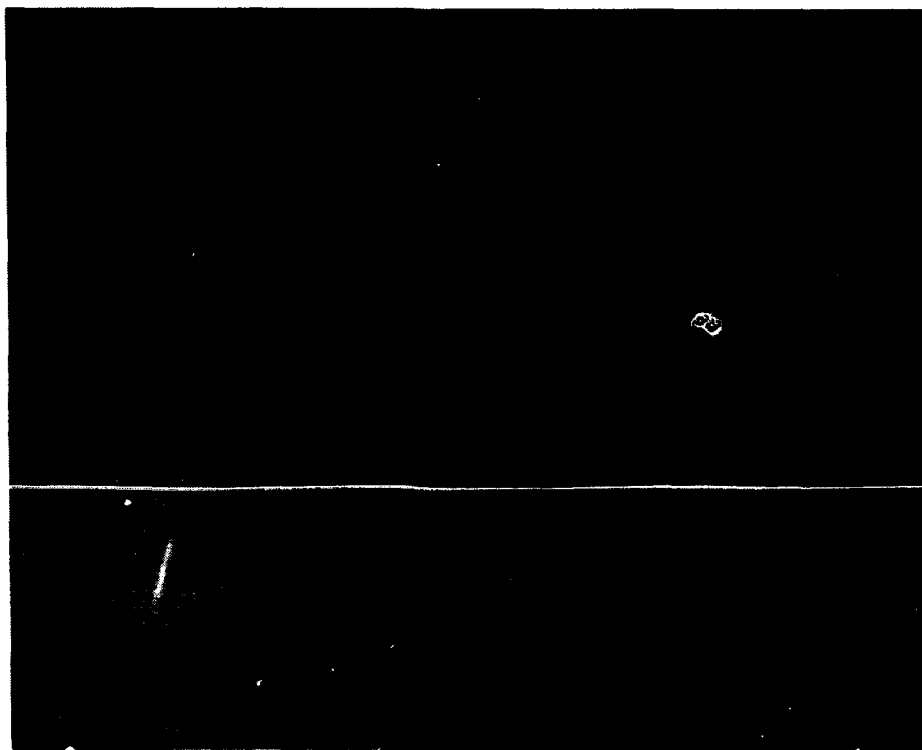
Outlined areas were solutioned joints on left abutment at approximate elevation 630 feet.



Small solution features along joint on left abutment. Cavities extended approximately 5 feet into rock along axis of joint.



Extent of concrete backfill required to cap off solution features.



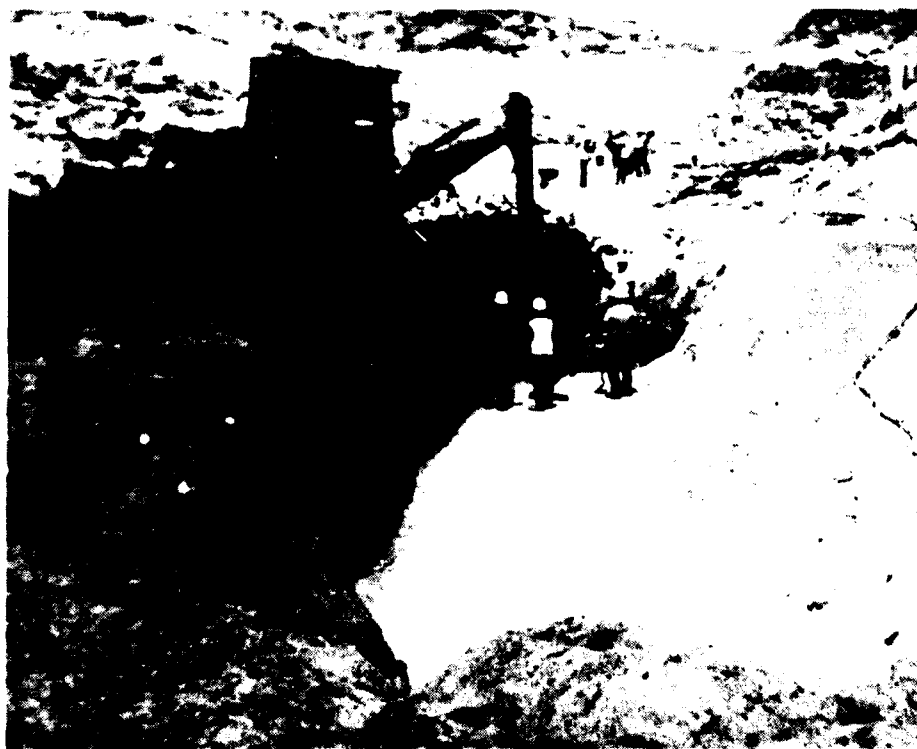
Picture shows condition of cutoff trench floor (El. 610 feet) after receiving dental treatment. View to the north into the trench.



Cutoff trench floor (El. 610 feet) receiving initial lift of impervious fill. 7 July 1983



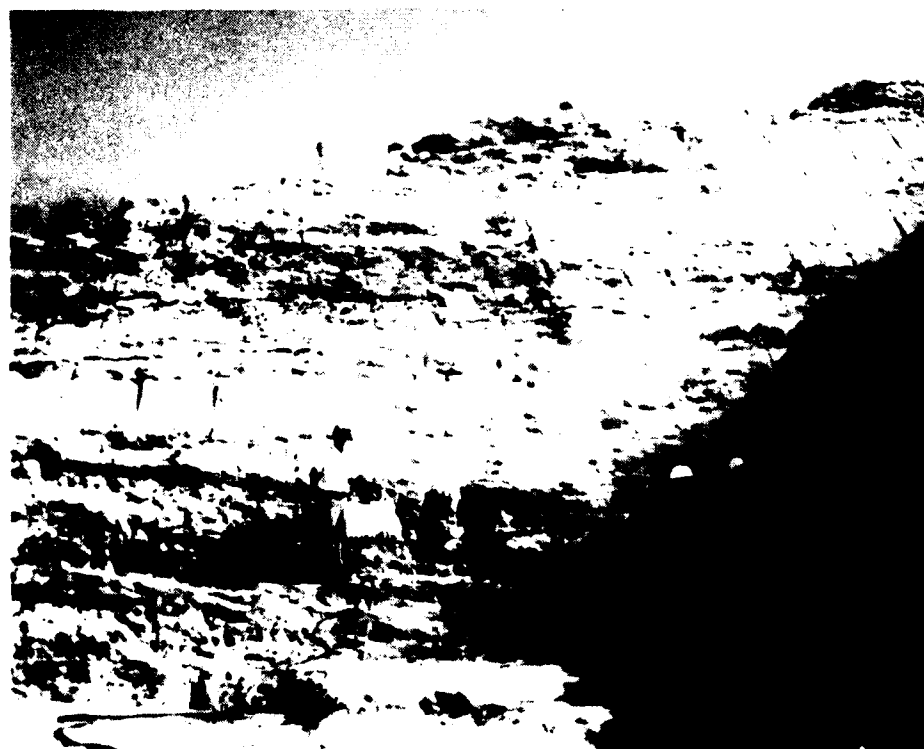
Cutoff trench floor (el. 610 feet) receiving initial lifts of impervious fill. View to the north. 7 July 1983.



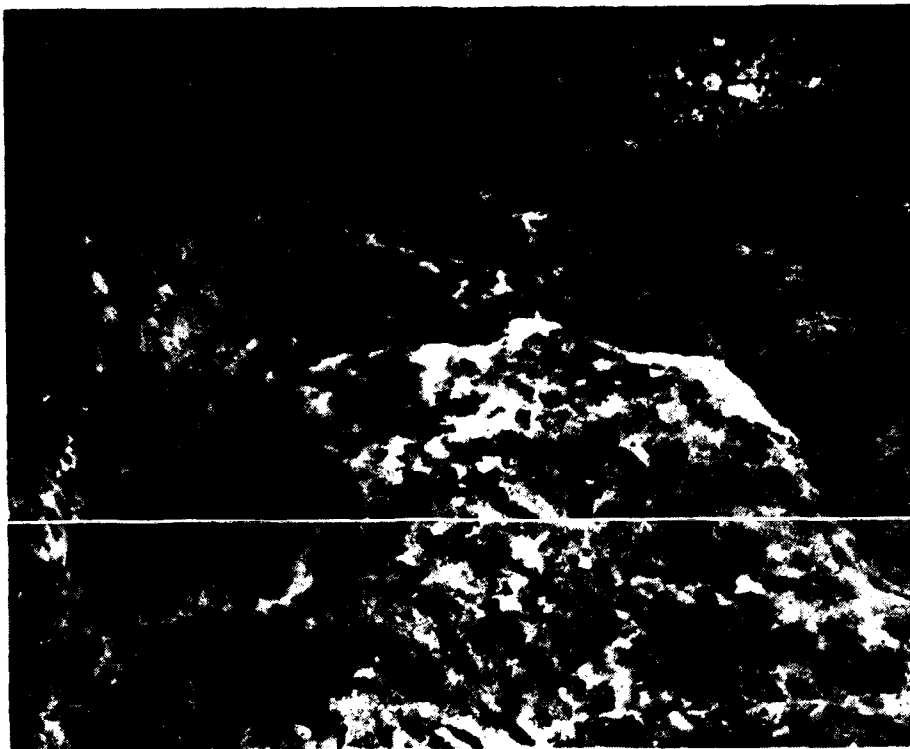
Cleaning cutoff trench floor (el. 610 feet) for placement of sand filter drain against downstream wall of cutoff trench. 20 July 1983.



Picture shows condition of cutoff trench floor (el. 620 feet) after receiving dental treatment. Circled area was a joint traversing floor of trench which was backfilled with concrete.



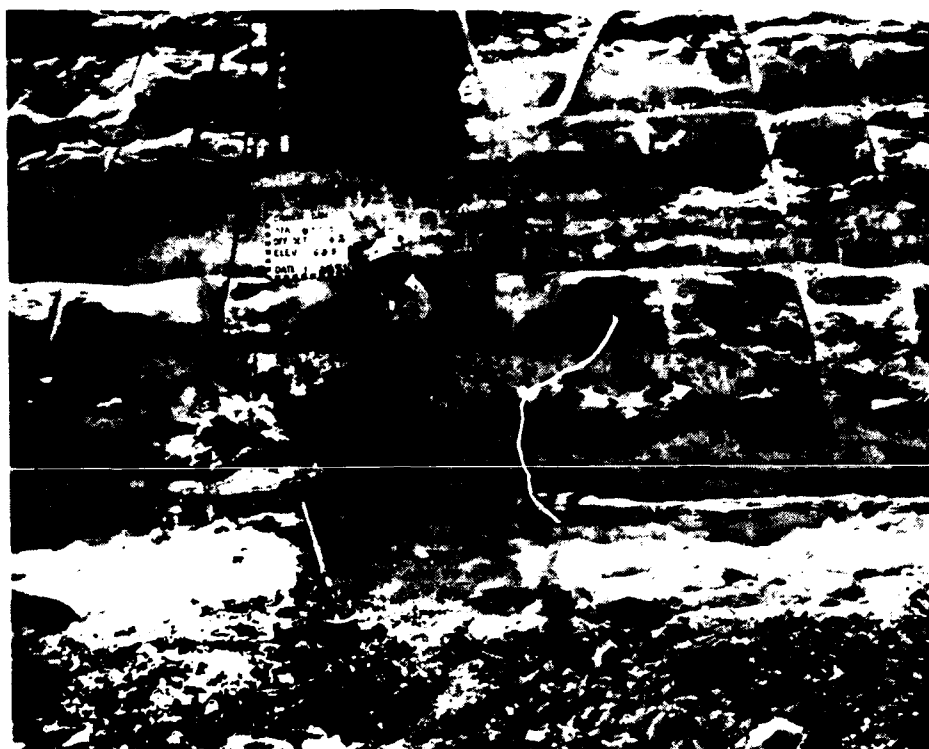
Picture showing back wall of cutoff trench. Approximate stationing of back was from 20+85 (at el. 620 feet) to 21+00 (at el. 640 feet).



Looking down at cutoff trench floor (el. 620 feet). Note concrete capping joint which traversed floor.



Station 19+05, Offset 20 feet upstream, Elevation 615 feet. Final foundation of upstream cutoff trench wall. 7 July 1983.



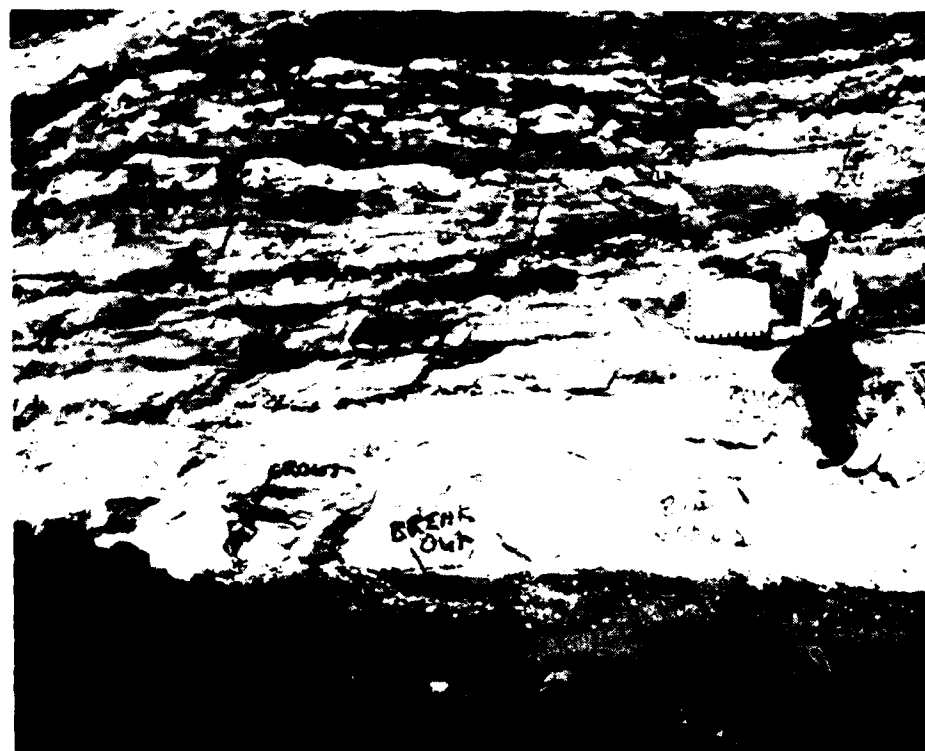
Station 19+50, Offset 30 feet upstream, Elevation 625 feet. Final foundation of upstream cutoff trench wall. Note lenses of chert which were encountered. 28 July 1983



Station 20+00, Offset 30 feet upstream, Elevation 625 feet. Final foundation of upstream cutoff trench wall. Picture shows condition of rock before receiving dental treatment. 28 July 1983

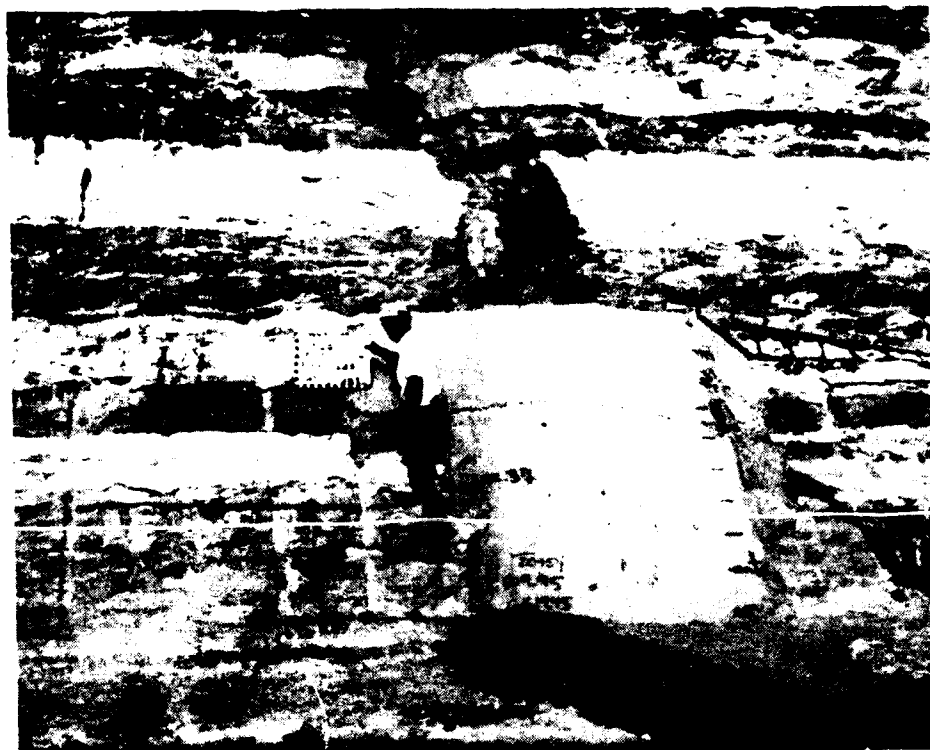


Station 19+20, Offset 25 feet downstream, Elevation 615 feet. Final foundation of cutoff trench wall in sand filter drain zone. 7 July 1983.



Station 20+00, Offset 30 downstream, Elevation 620 feet. Final foundation of cutoff trench wall in sand filter zone. Area was blown down with compressed air with no jackhammering being performed. 27 July 1983.





Station 20+60, Offset 15 feet upstream, Elevation 625 feet. Final foundation of cutoff trench wall. Fillet was required to seal off large solution joint. 28 July 1983.



Station 20+20, Offset 27 feet downstream, Elevation 630 feet. Final foundation of cutoff trench wall in sand filter drain zone. Treatment required blowing down rock with compressed air only. 11 Aug. 1983.

**END**

**FILMED**

**12-85**

**DTIC**